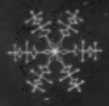
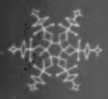
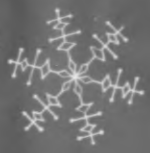
Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

DECEMBER • 1958







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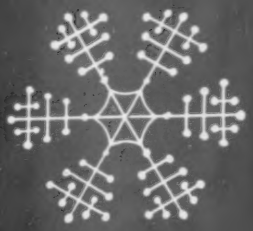
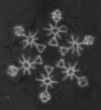
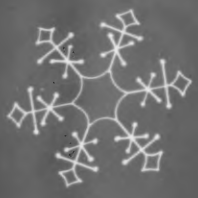
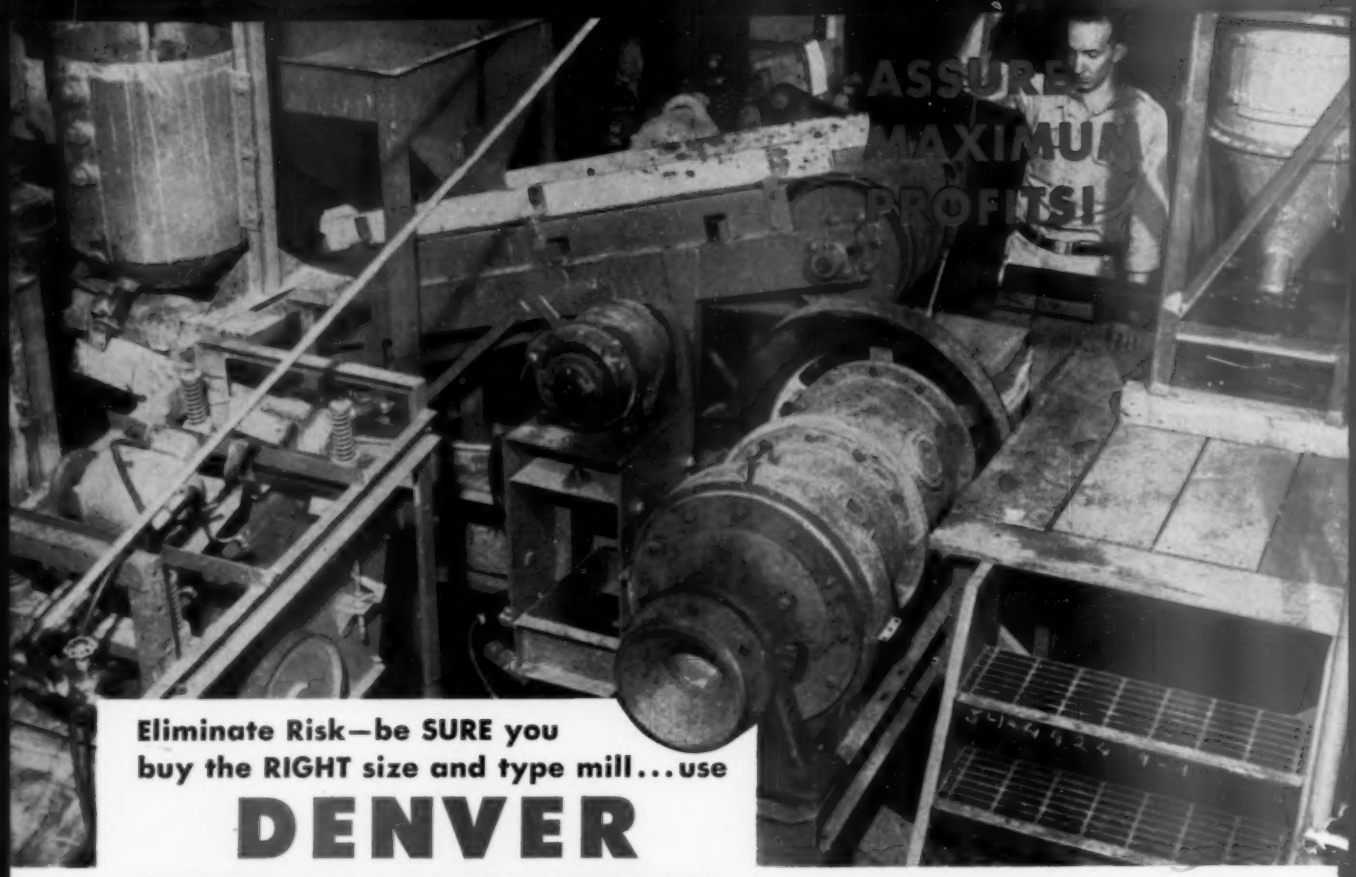






Season's Greetings



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Before you invest in a grinding mill, BE SURE! DENVER's completely equipped testing lab, backed by techniques and knowledge gained in more than 30 years of practical test and field experience, can give you a quick, economical and practical solution to even the toughest of grinding problems *before you get into* production!

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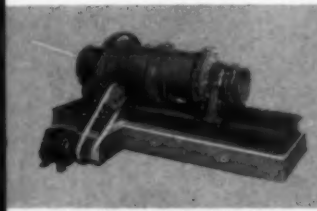
- **Preliminary Examinations** made without charge. Flowsheet studies and technical bulletins are available on request. Write today.



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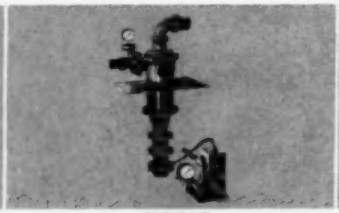
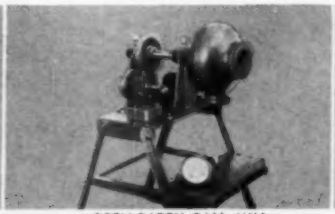
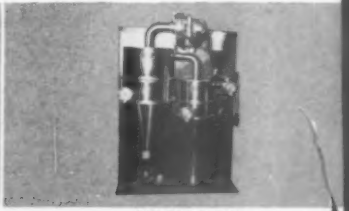


CYCLONE



OPEN-BATCH BALL MILL



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B.F.Goodrich

Men punch holes in rock to blow up a cliff

B.F.Goodrich improvements in rubber brought extra savings

Problem: Those workmen are drilling holes for dynamite charges, to blast out rock for a dam. It's no cinch to lug a heavy drill down a cliff like that. Too many times it had to be promptly carried up again—the tool had choked to death.

When heat from the compressor got into the hose, it would harden the rubber, breaking it into loose, gummy particles that clogged the air tool, put it out of action.

What was done: B.F.Goodrich engineers went to work on the problem. By adding, subtracting, changing proportions of rubber, they found a special compound that stands hot air, won't harden, crack, or break into gummy particles to clog tools.

Savings: Hose lined with this new rubber was made and put to work. On jobs where air hose used to go to pieces in weeks, B.F.Goodrich hose lasts months, even years. The nuisance of clogged tools was ended permanently.

Extra benefits: Resistance to heat is only one of the improvements made in this B.F.Goodrich air hose. It has a cover so rugged that dragging over rough rock won't tear it. And it's light, flexible, easy to work with.

Where to buy: Your B.F.Goodrich distributor has exact specifications for the B.F.Goodrich air hose described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-472, Akron 18, Ohio.*

B.F.Goodrich *air hose*

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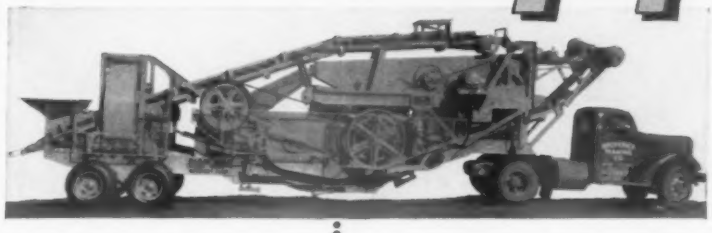
Outproduces every machine in its class

77 DIAMOND

PORTABLE *Rotor-Lift* CRUSHING PLANT



The Diamond 77 provides:

- **Powerful crushing capacity . . . 10″ x 36″ jaw crusher . . . 36″ x 22″ or 36″ x 24″ roll crusher.**
- **Fast separation on a 4′ x 12′ vibrating screen.**
- **Belt conveyors 30″ wide.**
- **Speedy, continuous movement of aggregate with the "line-flow" rotor lift principle.**

When you can turn out 240 tons per hour of 1-inch minus road aggregate in 70% crush, you're bound to make money. That's the record of an all-electric Diamond 77 on location in a Utah gravel pit. Screen, rotor lift and each conveyor is driven by its own electric motor for positive, trouble-free operation . . . continuous production.

The Diamond 77 outproduces every machine in its class. Ask any Diamond user. He'll tell you he gets high production at low cost consistently. Wherever the Diamond 77 works, hourly output of 300 to 400 tons of ¾″ road gravel in 25 to 35% crush is repeatedly reported. Substantial tonnages are obtained even in hardest rock.

Record productions were Diamond engineered from the very beginning. Material flow is shorter . . . faster. Diamond's "Line Flo" Rotor-Lift insures speedy, continuous movement of aggregate . . . eliminates by-passes . . . bottlenecks. Oversize crushers, vibrating screen and extra wide belt conveyors give that extra capacity for greater output . . . smooth, dependable operation.

Add Diamond's complete portability . . . ready for the road without costly delay . . . readied for operation at new locations just as easily. And remember, Diamond 77 outproduces every machine in its class . . . in fact regularly exceeds its own rating. So before you decide on a crushing plant . . . see Diamond.

For full description, write for Catalog D-5415.

Diamond makes everything for the aggregate producer:

Jaw Crushers • Roll Crushers • Conveyors • Screens and Washers • Feeders and Bins • Portable and Stationary Crushing Plants for Rock and Gravel.

DIAMOND IRON WORKS

DIVISION

GOODMAN MANUFACTURING COMPANY

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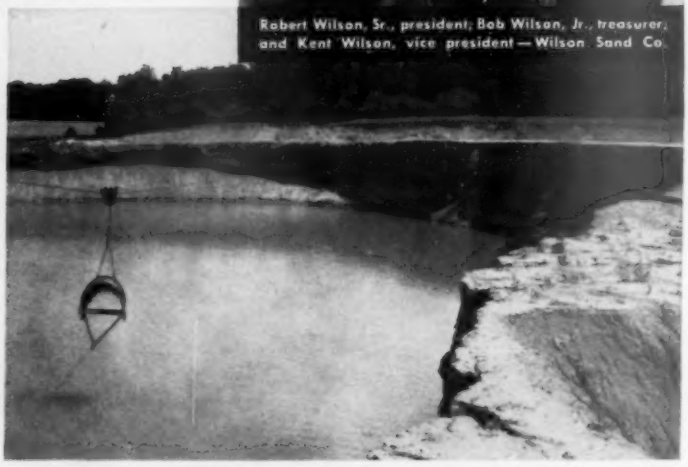
Sauerman DragScraper Digs and Hauls from Pit to Hopper for 8¢ Per Yard

Robert Wilson, Sr., president; Bob Wilson, Jr., treasurer; and Kent Wilson, vice president—Wilson Sand Co.

Track Cable DragScraper inhauling load to hopper from 40 ft. below water.



DragScraper and carrier returning to pit by gravity. Average haul is 500 ft. on a 675-ft. span.

Operating costs for Wilson Sand Co.'s new Sauerman DragScraper are estimated to be less than 8 cents per yd. This includes labor, maintenance and power costs to dig from 40 ft. below water level and deliver 90 yds. per hr. to the field hopper on an average haul of 500 ft.

Wilson Sand Co.'s new 125-tph. plant represents a steady increase in capacity which started with 20 tph. in 1939, using a small Sauerman Slackline.

Sauerman equipment has kept pace with the growth of their Upper Sandusky, Ohio plant. The Slackline was replaced by a 1½-yd. track cable DragScraper in 1951, and with a 2-yd. machine in 1953. The new Sauerman unit is a 3-yd. track cable DragScraper operated by a two-drum electric hoist equipped with air controls.

The DragScraper is digging 35 to 45 ft. under water down to bed rock on a 675-ft. span. The pit bank stands 40 ft. above the water, thus total depth of the deposit recovered by the DragScraper is about 85 ft.

Excellent material and the right equipment to dig and process are responsible for the continued growth of the Wilson Sand Co. Officers of the company are Robert W. Wilson, Sr., President, Kent Wilson, Vice President and Bob Wilson, Jr., Treasurer.

You can cut *your* costs by digging and hauling with a Sauerman Machine sized to match your plant capacity. Track cable Drag-Scrapers dig from high banks, dry pits and deep water. They are built in sizes up to 15 yds. and operate economically on 1000-ft. spans. Start reducing your operating costs—write or call and tell us your job requirements.

After discharging load into field hopper, DragScraper is lifted from pile for return to pit. Conveyor at left loads to plant.

This Sauerman two-drum hoist controls operation of DragScraper.

SAUERMAN BROS., INC. 630 SO. 28th AVE. BELLWOOD, ILL.

Linden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent DragScrapers • Slackline and Tautline Cableways • Durolite Blocks

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ALWAYS READY TO GO!

THERE IS NO MORE VALUABLE QUALITY IN SHOVEL OR CRANE EQUIPMENT!

One of the many NORTHWEST Shovels handling Iron Ore. This 80-D is in Texada Mines, Vancouver, B. C.

No other single advantage of Northwest equipment has resulted in so many repeat orders. Your Northwest is always ready to go! *We hear it everywhere and Northwests users will tell you so.*

Northwest dependability is a direct result of Northwest design. Power is brought to the action by the most direct route. Machinery Bases and Machinery Side Frames are heat treated cast steel to take the shocks of digging. Parts and assemblies are ruggedly built and heavy enough for the job to be done. The simple "Feather-Touch" Clutch Control brings ease of operation and is free from compressors, valves, tubing and other delicate mechanisms. The Helical Gear Drive, the Cushion Clutch, Uniform Pressure Swing Clutches not only play a part in better output but they combine in smooth, trouble-free operation to *assure performance when it is needed.*

Your Northwest is *always ready to go!* There is no more valuable quality in Shovel or Crane Equipment. You can buy it in a Northwest.

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Convertible for any Mining Material Handling or Excavation Problem

Always Ready to GO

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

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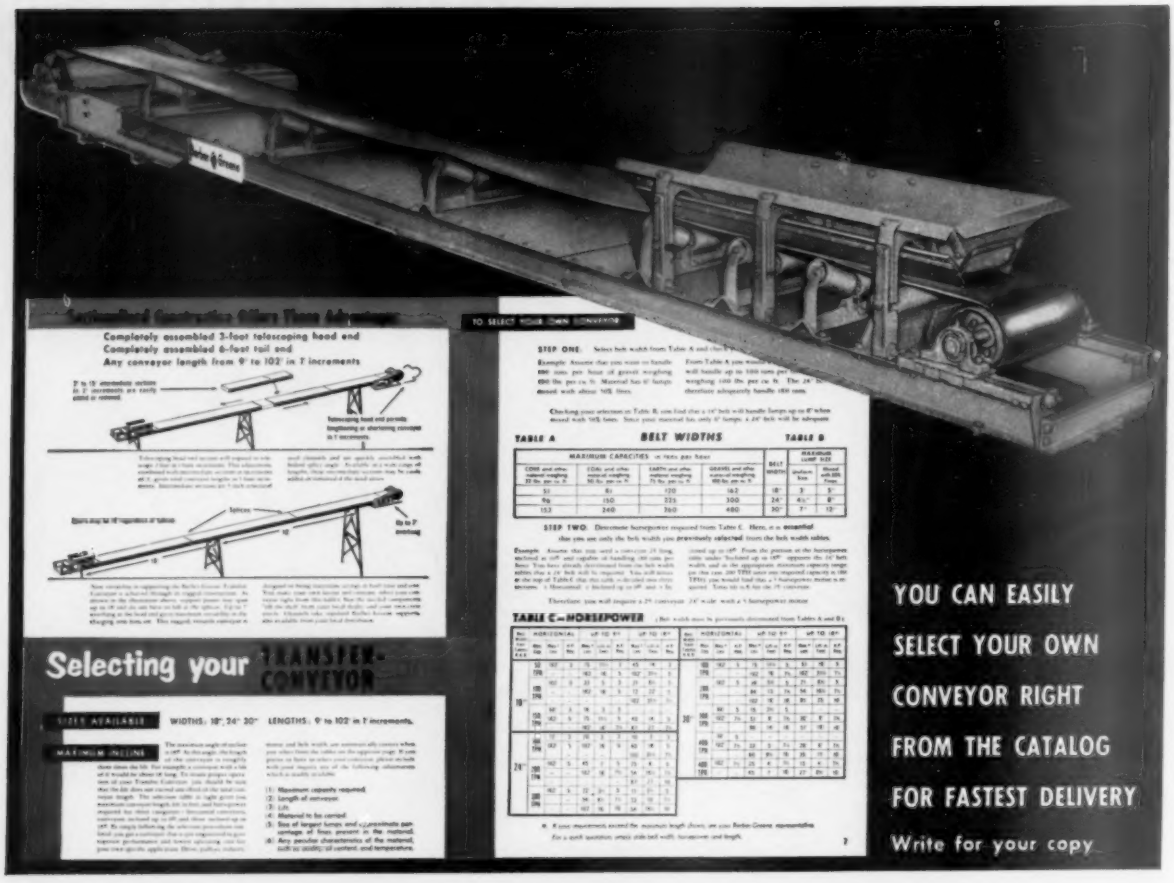
Selecting your TRANSFER-CONVEYOR
YOU CAN EASILY SELECT YOUR OWN CONVEYOR RIGHT FROM THE CATALOG FOR FASTEST DELIVERY
Write for your copy

New, low-cost belt conveyor now available in lengths to 102′

If you handle bulk materials, you should have a copy of the new Barber-Greene Transfer-Conveyor Catalog. With it, you can readily select your own conveyor. Belt width and horsepower are automatically correct for your job.

The Barber-Greene Transfer-Conveyor has cut costs on so many jobs that its range has now been extended to 102′ in 1′ increments. Belt widths are 18″, 24″ and 30″.

Because the Transfer-Conveyor is pre-engineered and made up of standardized components, special engineering time and expense are eliminated, and shipment is from stock—usually from the local distributor's stock. Erection is merely a matter of bolting the major components together and positioning the conveyor. Sectionalized construction gives flexibility for lengthening or shortening to meet future requirements.

Other Transfer-Conveyor advantages include:

Rigidly braced channel frame allows 7′ overhang at head end, 18′ spans between supports.

Head and tail end sections shipped completely assembled, aligned and adjusted.

Heavy-gauge steel decking protects return run of belt.

Worm gear reducer, running in oil, cuts maintenance expense.

Ball-bearing carriers assure long, trouble-free life.

Heavy thread screws provide belt tension adjustment.

Parts interchangeable and repair parts readily available.

58-20-TC

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

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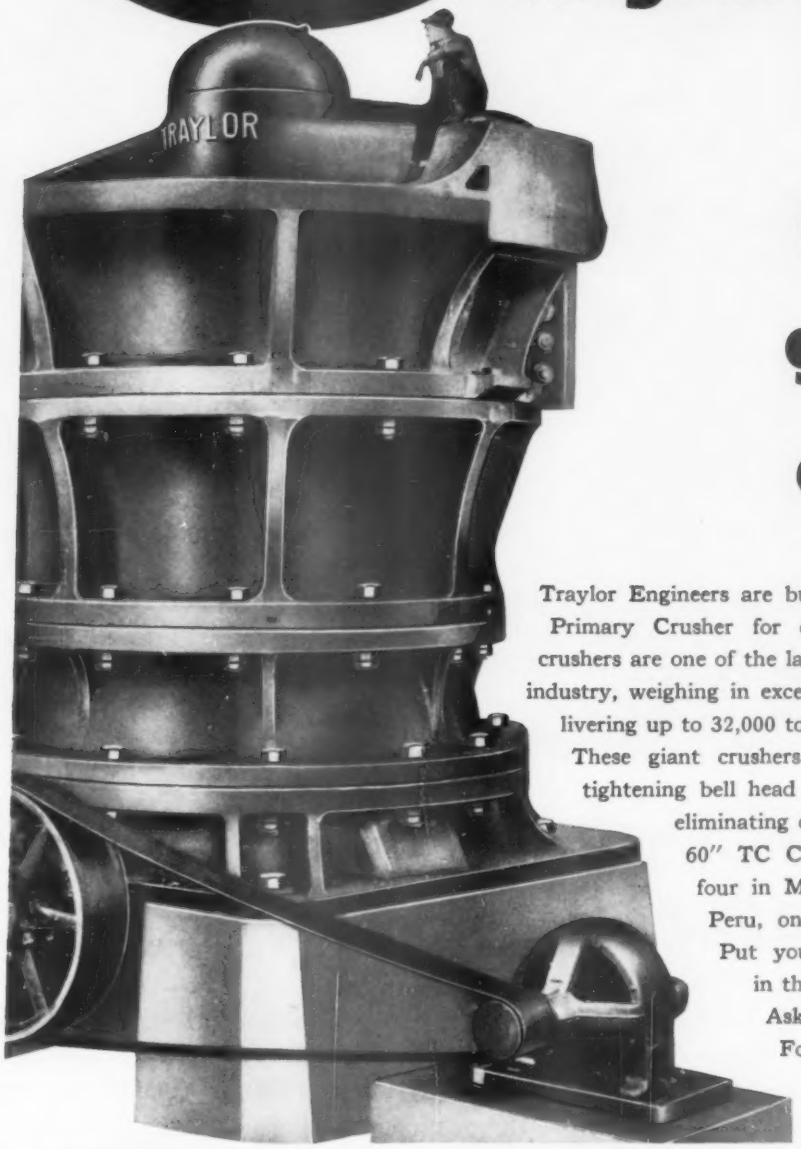
Traylor

largest producer of 60" primary gyratory crushers



Traylor Engineers are building the 10th Traylor 60" TC Primary Crusher for delivery. These mammoth 60" crushers are one of the largest pieces of machinery used by industry, weighing in excess of one million pounds and delivering up to 32,000 tons of product per eight hour day. These giant crushers feature Traylor's original self-tightening bell head and curved concaves, practically eliminating choking and packing. One of the 60" TC Crushers is in use in Minnesota, four in Michigan, one in England, one in Peru, one in Chile and one in Arizona. Put your crushing machinery problems in the hands of experienced engineers. Ask about Traylor-made machinery. For more on TC Gyratory Crushers, write for bulletin No. 1126 today.

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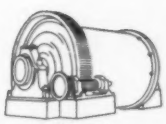
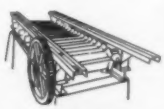
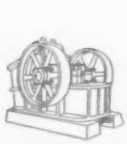

BALL MILLS

ROTARY KILNS


APRON FEEDERS

PRIMARY GYRATORY CRUSHERS


JAW CRUSHERS

SECONDARY GYRATORY CRUSHERS

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You can drastically cut the number of

Texaco Simplified

A co-ordinated group of just six lubricants for *all* major quarry equipment has shown significant savings in man-hours and inventories.

Texaco's Simplified Lubrication Plan has been developed to help you streamline your maintenance methods—to keep maintenance expense at a minimum in spite of rising operating costs. Developed in the field, it has already proved its value to others; here's how it can work for you:

How Simplified Lubrication Plan works

Exhaustive field tests and experience have uncovered this basic fact: *just six Texaco lubricants will take care of most quarry equipment needs.* This can mean not only a significant reduction in inventory, but above all, a virtual elimination of lubrication confusion and misapplication.

Your nearest Texaco Lubrication Engineer is well qualified to set up a Lubrication Plan geared to your particular needs. He will consider not only your equipment, but also your weather conditions, terrain and work loads, before arriving at the best Plan for you. His expert advice can save you thousands of dollars.

For more information on Texaco's Simplified Lubrication Plan, call the nearest of the more

lubricants required when you use a...

Lubrication Plan

than 2,000 Texaco Distributing Plants in the 48 States, or write to:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

SIX LUBRICANTS USED IN ONE TYPICAL PLAN:

Texaco Ursa Oil Super Duty for engine lubrication

Texaco Marfak Heavy Duty Special 2 for wheel bearings, chassis, water pump and other grease lubrication

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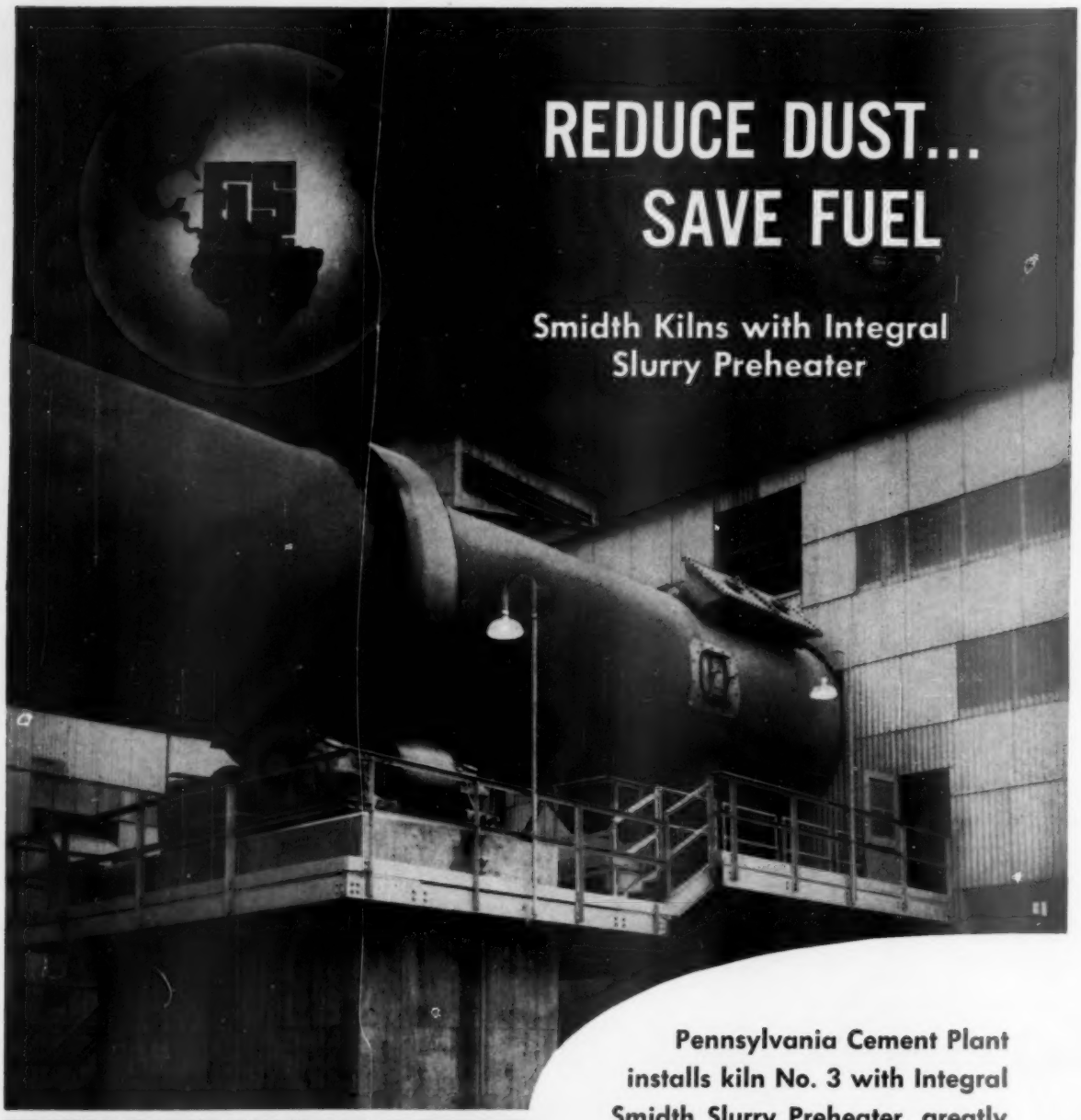
(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)



REDUCE DUST... SAVE FUEL

Smidth Kilns with Integral Slurry Preheater

Pennsylvania Cement Plant installs kiln No. 3 with Integral Smidth Slurry Preheater, greatly reducing dust loss and fuel consumption.

Smidth

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77 Vigerslev Alle
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What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

December, 1958

Better than seasonal strength marked construction activity as autumn began. Value of new construction put in place in October totaled $4,763,000,000, topping October, 1957, by three percent. October outlays brought the 10-month total to $41.1 billion, up two percent from $40.5 billion of the like period of 1957. Spending on private construction matched the pace of a year ago, with gains in home building and many types of nonresidential construction offset by a big drop in private industrial building. Public construction gained six percent from January through October over the 1957 period, with highways and public housing contributing most of the gain. The outlook for 1959: Good, but no boom. At the Pitt Conference on Business Prospects, University of Pittsburgh, Theodore J. Taylor estimated 1959 construction expenditures at about $50 billion, a four-percent increase over the expected 1958 figure.

Shippers may enjoy a reduction in freight rates if a drive by U. S. railroads to inaugurate a "fixed charge" system is successful. **The Wall Street Journal** reports that rail officials are seeking to adopt this form of volume discount, widely used in Canada and England. Under the plan, a railroad can offer freight rate reductions to shippers provided two conditions are met: The railroad must prove to Federal regulatory officials that it is losing out to competitors, such as trucks, and the shipper must agree to route a big portion of his shipments via the railroad for at least a year.

A joint approach to pollution problems is being considered by chemical producers along the Houston, Texas, ship channel, some of whom are accused of water pollution. **Chemical Engineering** reports that they are studying a proposal for a pipeline and plant that would treat all their process wastes. Advantages of joint disposal: One large treatment plant would be cheaper to build and operate than many small units, and the over-all job would be easier because of beneficial effects of combining dissimilar waste streams. Although only chemical producers are concerned in the present project, it is not necessarily limited to chemical plant wastes.

Not all air pollution comes from smokestacks, researchers agree. Other factors, including automobile fumes and wind erosion and dispersion, share the responsibility, but industry often is singled out as the dominant culprit. To plant owners who are cooperating with air pollution control programs, a news note from Los Angeles is encouraging. An anti-smog device is being tested on automobiles there by Automobile Manufacturers Association. The gadget has been developed by Ramo-Wooldridge to fit into the car muffler and curb exhaust fumes. Importance of this line of research is pointed up in a remark by Dr. W. L. Faith, managing director of the Los Angeles Air Pollution Foundation: "A long line of autos returning into a city after a weekend drive is equivalent to moving a smelter into that city, at least temporarily."

Carbon black can change atmospheric conditions enough to create clouds or to break them up. This has been demonstrated in tests by U. S. Navy scientists over the south coast of Georgia. Dr. Florence W. van Straten, Navy chemist, theorizes that introducing carbon black into the top of a cloud reduces its cooling rate. This tends to stabilize the atmosphere and the cloud shrinks to a wisp. Creating clouds with carbon black seeding requires a moist atmosphere. Here, temperature differences between seeded atmosphere and unseeded are created as the carbon black absorbs heat. Instability grows rapidly and clouds are formed. Much research is needed, says Dr. van Straten, before usefulness of the process is determined for preventing tornadoes and hailstorms, reducing or increasing rainfall and clearing fog.

Half the power and a fraction of the cost are said to be required to produce steel by the Strategic-Udy direct iron reduction process. Tests conducted at the prototype plant of Strategic Materials Corp., Niagara Falls, Ontario, have shown that semi-steel can be produced with a power consumption averaging 1,200 kwh. per ton of metal. This would be lower in full-size commercial plants. The process involves feeding of iron ore, coal and limestone into a rotary kiln where partial reduction of the ore takes place, then directing the hot kiln product to an electric furnace where it is quickly and completely reduced. A principal advantage of the method is the low capital investment required—for a 600-tpd. plant, it is estimated at $50 per ton of annual capacity. Of course, availability of raw materials is essential to its economic performance.

Concrete aggregates are being vacuum cooled at the Corps of Engineers' Hartwell Dam on the Savannah River. In this use of the process, said by **Engineering News-Record** to be the first in this country, high-pressure steam-jet systems cool mixed aggregate in 125-ton batches and sand in 80-ton batches. Mixing water is cooled continuously. The contractor is Guy F. Atkinson Co., and the equipment was developed by Croll-Reynolds Co., Inc. and John Hightower, an engineer on the Atkinson staff.

Wood waste and portland cement are the principal ingredients of a roofing material produced in Florida. Palm fronds also are utilized. Reinforced with 6 x 6 No. 10 wire mesh, panels are 2 in. x 2 ft. x 8 ft. Pressed by automation, they are removed from pallets after 24 hours and are cured for 28 days. As roof decking, the panels are reputedly more soundproof than gypsum, only a point lower in insulating qualities than cork and weigh 7¼ lb. per sq. ft.

Gilsonite, the natural hydrocarbon found in Utah, is being marketed as a cold bituminous concrete for road surfacing. Known commercially as Gilsapave, it can be laid cold, its distributors say, even after the temperature drops below 35 deg. F., the normal cutoff point for spreading hot-mix asphalt.

There was an open house at Westinghouse. Scientists at the company's research laboratories demonstrated new developments, among them an insulating material for motors called "Hot Rock." The insulation is designed to keep electric motors running in missiles and high-speed aircraft at high temperatures; to produce it, glass fibers are combined with phosphate, formed into required shapes and heat cured. To prove effectiveness of the insulation, Dr. H. R. Sheppard operated a ½-hp. motor which had been heated to 1,250 deg. F.

The editors

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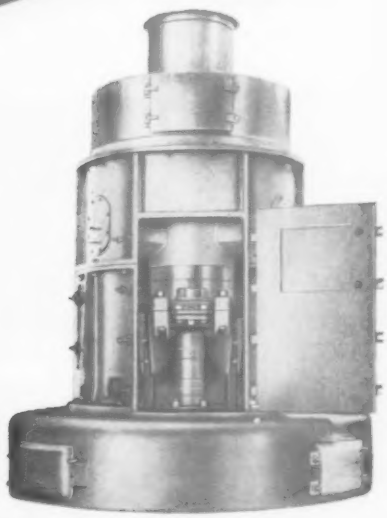

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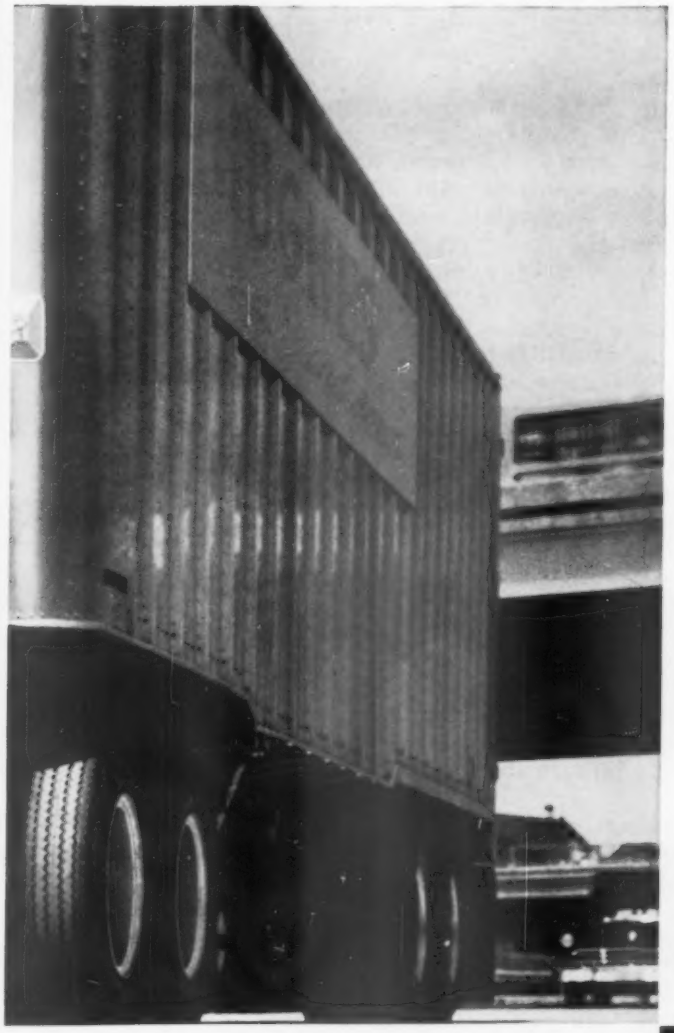

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EDITOR'S PAGE

George C. Lindsay, Editor

Reduce contract troubles and save money

TAKE TIME TO SPELL OUT, in your agreements to purchase or lease land or mineral rights, the full terms of the agreement in every detail. If you do, it will save you much inconvenience—and real money.

Some operators in the aggregates production industry—usually small ones—have been fouled up because they weren't careful. They may have relied on oral agreements, failed to specify all terms, or otherwise left too much to assumption. The result has been unexpected and costly court cases, with judgements placed against them.

The main trouble in some cases reviewed is that the buyer, or leasee, didn't take the trouble to find out what he was getting before he signed a lease. Here's an example of how not to be careful:

Operator A leased from owner B a 15-acre tract with right to mine sand therefrom for five years. Terms included—according to the written contract—an annual rental fee of $500, payable in advance, plus 25 cents royalty payment per truck load removed. Also, the lease contained an option to renew for an additional five years under the same terms.

Mr. A went to work, but soon found out that the leased deposit contained quite a bit of rock. On oral agreement, Mr. B allowed Mr. A to mine and process the rock, and rate of royalty payment was changed to 25 cents per cubic yard, for both sand and rock.

Work went along fine, Mr. A made some money—and some fairly costly equipment improvements—and took up the lease-renewal option for another five years on the basis of the orally revised contract terms. Trouble began about half way through the second 5-year period. The deposit petered out.

So—Mr. A moved his buildings, equipment and stockpiles to a new location, and apparently thought that was the end of it.

It wasn't, though, for he was sued by Mr. B for $1000 to cover two years' unpaid rental fee to complete the contract. And the case was ruled for Mr. B on the grounds that there was "no mistake of fact" as to how much mineral was available on the leased property (basis of Mr. A's denial). The decision was handed down even though the court found that there was no marketable sand on the property.

The mistake here, apparently, was that there was **no** specified agreement on what payments were required in case the mineral did run out. It was **assumed** that deposits would last through the second 5-year period.

This case points up only one area that was covered by no mutual agreement in the written lease; there are many that have been based on other equally important areas.

Courts decide cases on the basis of spelled-out agreements, not on mere assumptions by either or both parties to a contract. It is to your advantage to protect yourself fully in the next contract for purchase or lease that you sign.

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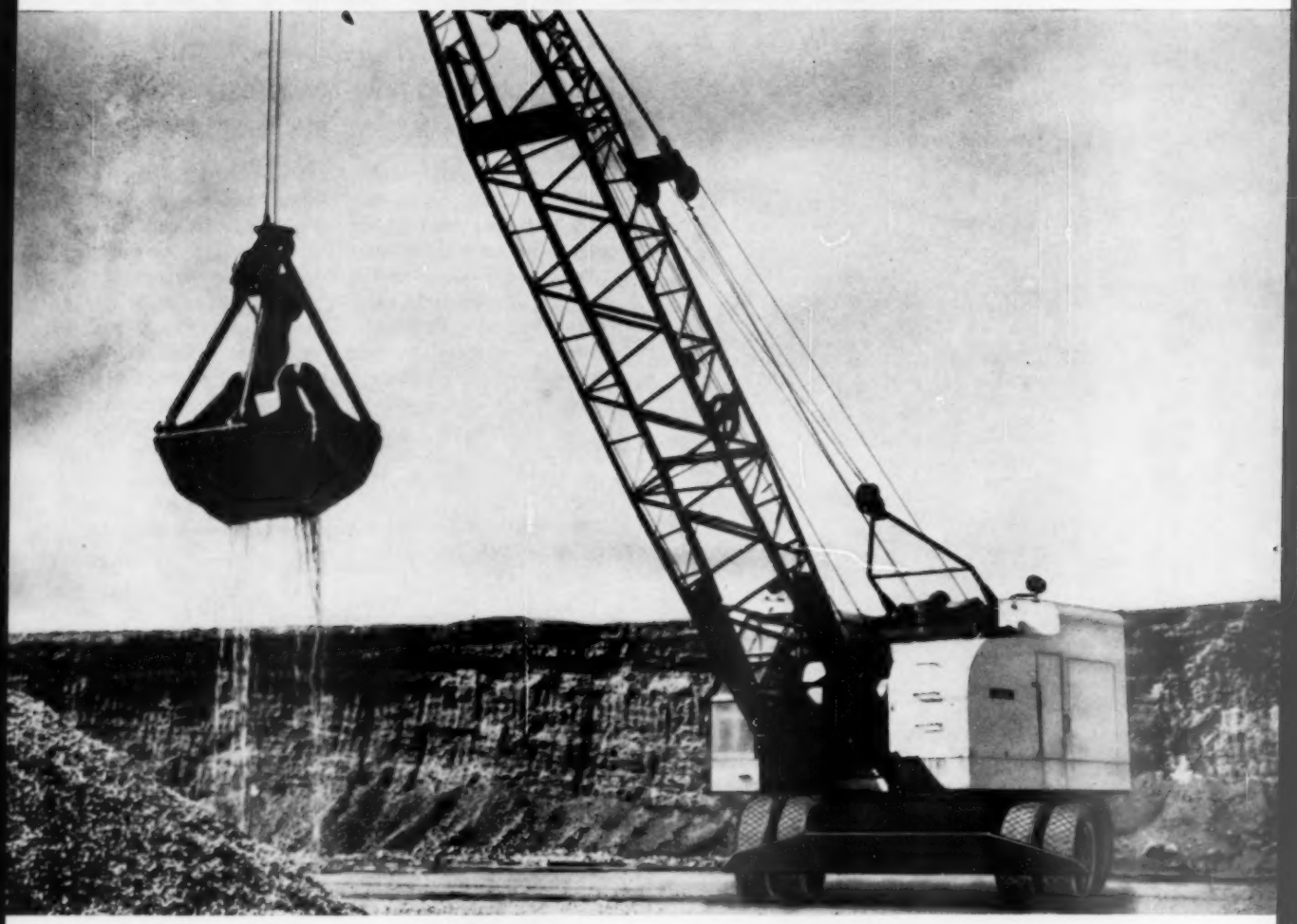

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ROCKY'S NOTES

NATHAN C. ROCKWOOD

More about uniformity in cements

SOMETHING ABOUT OUR "NOTES" in the September issue on the lack of uniformity in the physical properties of portland cement aroused "white heat" in one of our cement industry readers. He accuses us directly and indirectly of making "insinuations, inferences and innuendoes" that are "destructive," whereas he admits that the National Ready Mixed Concrete Association's Publication No. 76 on "Variations in Portland Cement" is entirely factual and ultimately will prove constructive. Our comments were based on this report. He concludes that he cannot see our objective, and expresses the opinion, at least by inference, that this writer is slipping mentally and that the "Notes" referred to will probably be one of our last contributions.

We are only mildly interested in his conclusion. Having lived this long, presumably like every other oldster, we have adopted or accepted a philosophy that recognizes all things to be transient. So, whether he refers to our early demise, or to the refusal of the publisher any longer to accept these contributions, is of small concern. The thing that does pique our curiosity is what there was in the article to arouse such high blood pressure in any reader. After rereading it several times we still can't see a logical answer.

However, we do not intend to have obscurity in anything we may write, and it is possible that frustration at not being able to find an obvious objective in the article under consideration was the real reason behind the explosion of invectives. All our "Notes" are not written to plant a moral. Since the complainer, who we know is a very intelligent person, found this defect, there may possibly be others, so we will attempt to clear up the issue, and to add enough new thoughts to justify this present brief discussion.

We headed the article with the question: "How uniform must portland cement be?" We intended it to begin with a question and to end with the same question unanswered, since only the concrete industry composed of both users or constructors and manufacturers of portland cement can or ever will answer it. Possibly the discussion should have been headed by the question a little differently phrased: "Need portland cement be of uniform quality?" At least that is a thought we had in mind and one of the inferences we hoped our discussion would develop.

We quoted from the Walker and Bloem National Ready Mixed Concrete Association's report enough to give a clue to its contents, emphasizing that the differences in cements proved by their investigations were of commercial significance to ready-mixed concrete producers or manufacturers. We trust that is self-evident, otherwise the investigation would not have been undertaken at all. One of the "innuendoes" objected to, we presume, is our discussion of the possible effect of the publication of these differences in cement on competition in the cement industry. This was intended to be a reminder that such competitive tactics are bad business, and in view of the fact that the differences found by these tests were for 28-day results only, any competition on alleged quality as a basis is unjustified; certainly not to be encouraged since the object of all of us is to promote the use of durable concrete rather than high 28-day tests.

Obviously, if the ready-mixed concrete producer is to make practical use of the results of this investigation he should test his cement periodically and adapt his mix to the peculiarities of the product he is presently using, just as he proportions his water, sand and aggregate mixture. Except in the

Please turn to page 126

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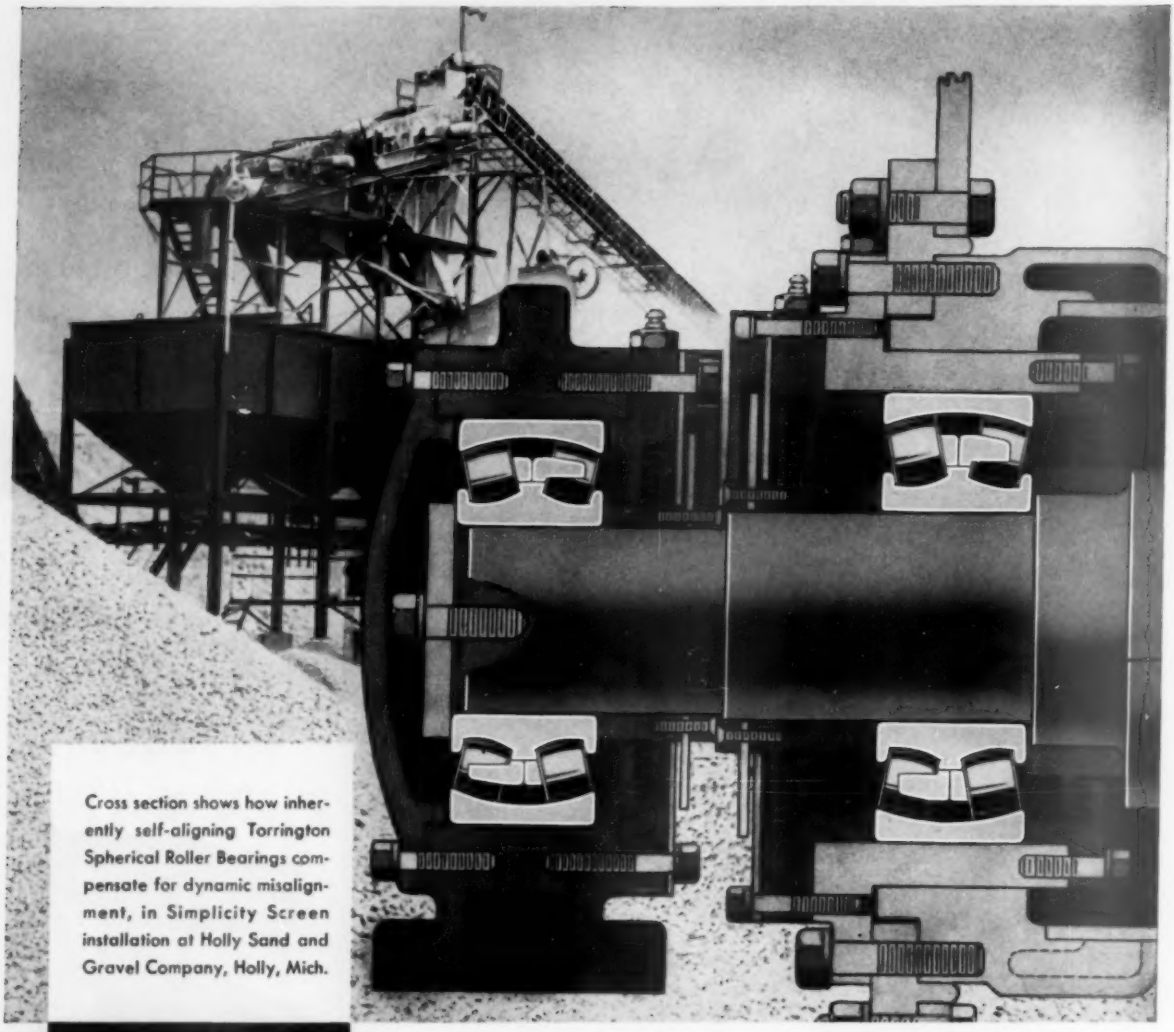

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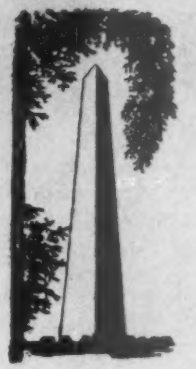

Washington Letter

Edgar Poe

New tax laws Affect small Corporations Small corporations, after this year, will have to decide by January 31 of the taxable year whether to take advantage of new tax laws permitting them to be taxed as partnerships. The small corporations this year had to decide by December 1. Under terms of the new law passed by Congress earlier this year, members of a corporation with 10 or fewer stockholders may waive corporation income tax on profits for 1958. Instead, the income may be taxed as income to the stockholders in proportion to their holdings in the company. In addition, corporation losses of a new firm can be used as a deduction against ordinary personal income.

Highway Spending Rising Federal Highway Administrator Bertram D. Tallamy predicts that capital expenditures for highway construction in this country—local, state and federal—will reach about $6.2 billion during this calendar year. The amount would represent an increase of about $500 million over the 1957 calendar year. He expresses the conviction that expenditures will reach $7.1 billion in 1959.

Higher gas Tax looms The Eisenhower administration may recommend to the 86th Congress that the federal gasoline tax be raised an additional 2 cents a gallon to help meet the costs of the expanded highway program. Unless more funds are steered into the program, it is now apparent the interstate program will not be completed as fast as originally estimated.

On the other hand, levying an additional impost on gasoline could have an adverse effect, because motorists everywhere are crying that they are already restricting their driving because of the high costs.

Meanwhile, the oil industry, which probably will have a depletion allowance fight on its hands in the next Congress, apparently is undecided as to what steps it would take if additional taxes are recommended. The present tax on a gallon of gasoline averages (lower in some sections and higher in others) about 37 percent of the total cost.

Seek auto Tax repeal The National Automobile Dealers will seek at the next session of Congress to get the excise tax on automobiles removed. Dealers are now urging members of Congress during their visits back home to remove the so-called "emergency" tax.

Chances are, however, that Congress will not lift the tax. Certainly the Treasury Department will oppose it. The Treasury Department has the job of raising funds to pay Uncle Sam's bills and those bills are many and big these days. Furthermore, it is next to impossible to get a tax repealed once it is levied by Congress.

Highway law Changes Alaska statehood has evoked a number of new problems in the federal departments. Under the Highway Act of 1956, a 41,000-mile Interstate System was provided, and all but about 350 miles have been allocated to the various states by the Bureau of Public Roads.

As a result the Highway Act will have to be amended to take care of Alaska in the future. The federal government puts up 90 percent of the cost of the divided, multilaned interstate roads, and the various states pay the remaining 10 percent. However, Alaska is receiving federal funds for primary, secondary and urban roads under the 1956 act.

Hawaii Statehood? Now that Alaska has become the 49th state, Hawaii statehood appears inevitable. The sole question is: When? It could very well become the 50th state in the 86th Congress. The non-contiguous area argument which hurt Hawaii's chances in the past has been ended with the admission of Alas-

ka. The Hawaii statehood bill will be one of the first measures introduced when Congress reconvenes January 7.

Initial Railway loan The New York, New Haven and Hartford Railroad is the first applicant to file for a special government loan as provided by Congress at the last session in an effort to help some roads whose backs are to the wall. The carrier applied to the Interstate Commerce Commission for backing of a proposed private loan of about $16.5 million to be used in buying 60 diesel electric switch engines built by General Motors.

The ICC has set up a new section to handle railway loan applications. Authority for making the loans was incorporated into the Transportation Act of 1958. During debate of the act, the ICC was accused of over-regulating the railroads, thus contributing to some of their financial headaches.

Assign river, Harbor funds The Bureau of the Budget plans to spend the $1 billion Congress appropriated for river and harbor and irrigation projects. However, the Bureau is expected to reduce its budget recommendations for the 1960 fiscal year by many millions of dollars because of the huge deficit facing the Treasury at the end of the 1959 fiscal year next June 30.

$42-billion Defense Budget? The next budget for the Department of Defense which the White House will submit to Congress in January probably will call for around $42 billion, or $1 billion more than the present department spending. However, the official recommendation will not be disclosed until President Eisenhower sends the budget to Congress.

Population Is zooming A half dozen states experienced population increases of 1,000,000 people or more from April 1, 1950 to July 1, 1957, according to a new report by the Census Bureau. California, apparently destined to outstrip New York before 1970, was the leader by far with a gain of 3,293,000. The others: Texas with a gain of 1,464,000, Florida with 1,438,000, Michigan with 1,334,000, New York with 1,318,000 and Ohio with 1,260,000. Six states—Illinois, New Jersey, Indiana, Maryland, Pennsylvania and Virginia, had population increases that ranged between 500,000 and 1,000,000.

The population of the West grew faster (26 percent) than any region of the nation, or twice the national average of 13 percent. From a percentage standpoint, Nevada with 63.4 percent chalked up the biggest gain, with Florida second with 51.9 percent.

Population of this country reached 175,000,000 in October. By next October, the population will have climbed an additional 3,000,000 or the equivalent of another state the size of Louisiana.

It is obvious that the rock products industries will need to grow in the years ahead to aid in providing new homes, schools, churches, streets, highways and shopping centers.

Social Security Taxes up Effective January 1, employers in the rock products and other industries will pay 2½ percent social security taxes on employes' wages and salaries up to $4,800. Beginning January 1, 1960, the rate will rise to 3 percent, and it will climb to 4½ percent by 1969.

Steel use To climb Indications are that steel use next year will be substantially higher than 1958 when about 87 million tons were used. The construction industry probably will use more steel in 1959 than any year since 1955, when a record of 117 million tons were used. Because of the expansion programs that have taken place in recent years, the industry is expected to meet demands without difficulty.

Labor Reform Legislation Secretary of Labor James P. Mitchell, in a series of speeches all over the country, declares that labor reform legislation, if it is going to have teeth in it, must include provisions against secondary boycotts and "blackmail picketing." The cabinet officer maintains that the Eisenhower administration will deal with those proposals when Congress reconvenes.

A secondary boycott, which some labor leaders invoke, occurs when threats and other forms of coercion are used against an employer to make him stop doing business with a second employer when the latter is being struck. Blackmail picketing is an effort to force an employer to recognize and bargain with a union which his employes have rejected and do not want as their bargaining agent. Mr. Mitchell maintains that any bill that overlooks these is overlooking sources of corruption.

END

Architect's rendering of the new Bagpak plant in Litchfield, Ill.

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Ohio River Sand Co., Inc. is the largest sand and gravel producer in Kentucky. Its materials are dredged from the Ohio, washed and separated into 4 grades, then barged to Louisville and stockpiled.

A Hough 9,000 lb. carry-capacity "PAYLOADER" is the mobile load-out equipment at Louisville. Two years ago it replaced a Hough Model HM — one of the original 4-wheel-drive "PAYLOADER" units — that had served well for over 9,000 hours.

The "PAYLOADER" operator, P. R. Jackson says, "its break-out bucket action works wonders with frozen material — loads 21 ton trucks in 7—8 minutes and 60-ton railroad cars in 12 minutes. It has good balance under the biggest loads and excellent maneuverability and ease of operation."

Sand, gravel and crushed stone producers everywhere are holding the line on handling costs with continuously-improved "PAYLOADER" tractor-shovel models, backed by reliable Hough Distributor organizations.

Aggregate producers also know how much the many tractor-shovel improvements pioneered and introduced by Hough have helped them improve their operations and service to their customers — basic advances such as four-wheel-drive, torque-converters, power-shift transmissions, power-steering, planetary final drives, pry-out roll-back bucket action, power-transfer differentials, hydraulic load-shock absorbers, and pressure-controlled hydraulic systems.

Your Hough Distributor is ever-ready to give you full information on the newest "PAYLOADER" models in a size or sizes to meet your needs. Contact him today and be better equipped to compete tomorrow.

"Its Ease of Operation means maximum operator efficiency"

Thomas Venezia, Supt. of Massaro Company, Inc., Fulton, N. Y. says, "We've been using Hough 4-wheel-drive 'PAYLOADER' units since 1951 and have three now." Referring to the newest, a 9,000 lb.-carry-capacity "PAYLOADER" he says, "It has worked out very satisfactorily. We particularly like the ease of operation which means maximum operator efficiency and the roll-back bucket action that insures cleaner, faster operations."

"A definite loading advantage in hard digging"

Paul Marshall, Plant Supt. of Lambert Brothers, Inc., Knoxville, Tennessee says, "This 9,000 lb. carry capacity 'PAYLOADER' is more trouble-free than any other rubber-tired loader we've ever used." Quarrying and producing limestone in sizes from 2½ inches down, they use the "PAYLOADER" to stockpile 75% of their material and to load out *all* of it — up to 2500 tons in 9 hours.

"Has worked over 3,500 hours in continuous day-night production"

W. M. Gatewood, Asst. Plant Supt. of West Sand and Gravel, Inc., Richmond, Va. also says their 9000 lb.-carry-capacity "PAYLOADER", "Keeps the yard stockpile moving out, averaging 2,500 tons per ten hours without pushing. We have found it versatile, fast and dependable . . . digs packed materials faster than other large loader on same job . . . good balance and traction."

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SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
705 Sunnyside Ave., Libertyville, Ill.

Send full information on 4-wheel-drive "PAYLOADER" models

Name _____ Title _____

Company _____

Street _____

City _____ State _____

12-B-3

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How would you decide?

A round-up of actual day-to-day in-plant problems and how they were handled by management men

Can a worker be disciplined for insubordination?

What Happened: Ralph Taft was the best worker in the department. He knew his stuff—and what's more, he had 20 years of service. But Ralph didn't think much of his immediate boss. So in the locker room, and even on the job itself, Ralph criticized his superior. The supervisor got wind of

Ralph's none-too-fond opinion, and the two men had a good talk. Ralph agreed to curb his tongue. But he didn't do so—and he was given a two-week layoff. Ralph talked up in protest, and when his grievance came before an arbitrator, his contention was:

1. Sure I criticized my supervisor, but I was exercising my right of free speech.
2. A disciplinary layoff should be for poor work. Look at my record—the best in the department. I want the two weeks' pay I lost.

The company had something to say about all this:

1. A company is a place for work —not speechmaking.
2. Ralph's criticism of his supervisor created bad morale in the department, and lowered the status of the boss.
3. Ralph was guilty of insubordination and deserved even more than he got. We were too lenient with him. He should have been fired.

Was the company:
Right? ☐ Wrong? ☐

What Arbitrator Myles S. Boothe ruled: "Freedom of speech and expression are reserved as the right of every individual by our way of life in a democracy. These cannot be denied. However, where improper conversation regarding supervision and the company occurs ON THE JOB, this is tantamount to insubordination, and a remedy is justified. The company's action is sustained."

Are senior employes entitled to get "first crack" at overtime?

What Happened: Because of a downturn in business, overtime work was getting scarcer. Whenever such assignments came up, Supervisor Masur would parcel out the extra time to employes he felt needed it most. For example, there was John Kline. His wife had recently given birth to twins, which put a heavy load on John's pocketbook. So the supervisor saw to it that John made a few extra dollars when overtime came up.

The union didn't like the way Masur was handling these assignments. "We have a seniority system here, and that means that the old timers must get first crack at overtime. Let Kline wait his turn."

"I know the contract inside-out," said Masur. "It doesn't say that overtime has to be parcelled out by seniority status."

"It doesn't have to say it," maintained the union. "We have a general seniority clause and it applies to all situations. If you don't go along, we're going to take it up with management."

When the front office supported its foreman, the case went to arbitration. The union admitted that its seniority clause did not mention "overtime" but did include promotion and layoffs. However, the union argued that seniority is to protect a worker against discrimination. Assigning younger men to extra-hour work is just that.

The company saw it another way. Seniority is not an automatic right. It exists only insofar as specified in the union contract.

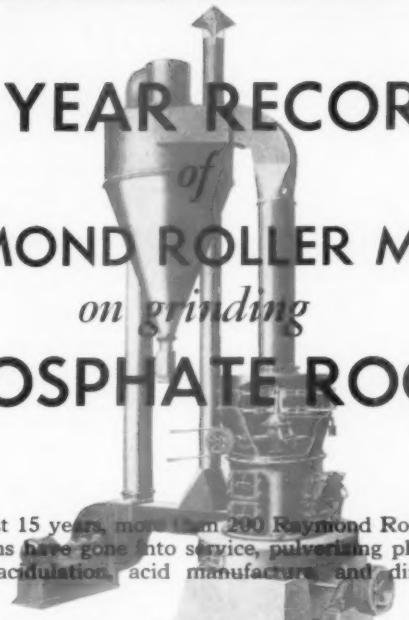
Was the company:
Right? ☐ Wrong? ☐

What Arbitrator McSwain, Jr. ruled: "It is undisputed that the company has not followed seniority in assigning the work. It is elementary, however, that seniority and seniority rights exist only insofar as they are provided by contract. Even without a 'management prerogative' agreement, management has the right to direct the working force and to assign work except as limited in the contract. The doctrine that seniority and seniority rights exist only by contract is a corollary of the inherent power of management. Grievance denied."

(Continued on page 30)

Each incident given in this department is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to Rock Products.

RAYMOND ROLLER MILL



15 YEAR RECORD
of
RAYMOND ROLLER MILLS
on grinding
PHOSPHATE ROCK

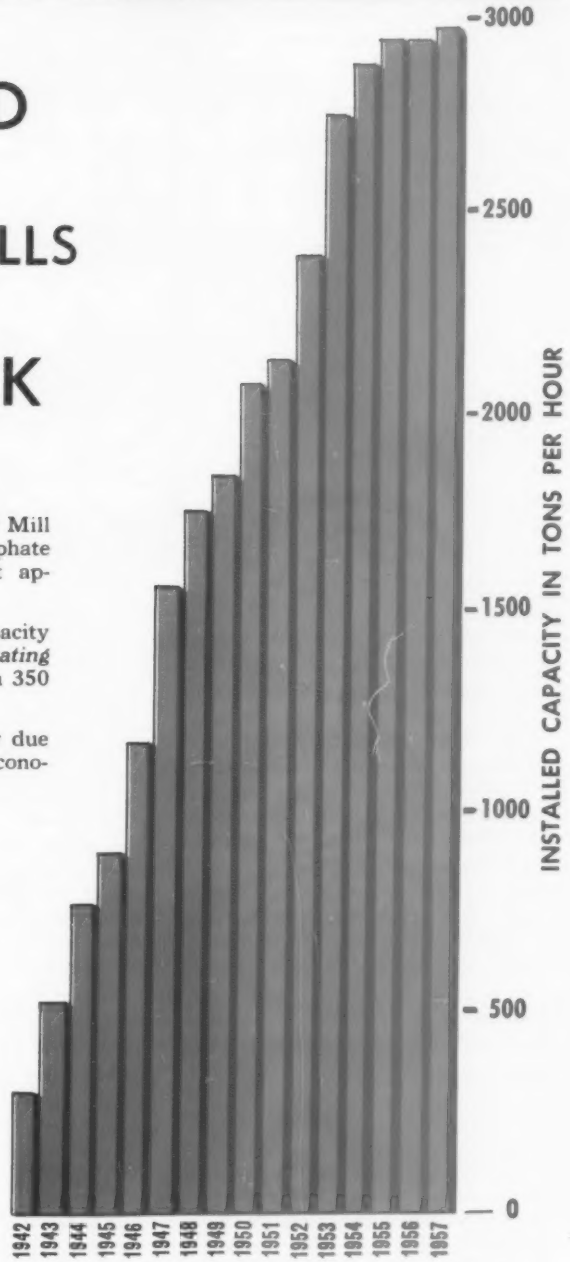
IN the past 15 years, more than 200 Raymond Roller Mill installations have gone into service, pulverizing phosphate rock for acidulation, acid manufacture and direct application.

As shown by the chart, this brings the installed capacity of Raymond Roller Mills to *nearly 3000 tons per operating hour, or in excess of 16,000,000 tons yearly,* based on 350 2-shift a day operation.

This phenomenal endorsement by industry is mainly due to the following advantages which add up to record economies year after year.

1. Lowest initial cost, power cost, and overall operating costs.
2. Dependable, long service life, backed by over 70 years' experience.
3. Ability to handle all known deposits with a wide range of capacities available.
4. Automatic, dust-free operation with a very minimum of attention.
5. Optimum particle size distribution and ease of fineness control.
6. Ability to dry, grind, separate and convey in one simple operation.
7. Minimum space requirements and flexibility to meet plant layout.
8. Low maintenance.
9. Active research and development over the years by Raymond to further improve grinding efficiency.
10. Competent engineering and operating service.

With a problem in this or a similar field, check the facts and compare. When put to test, Raymond proves best.



YEARLY GROWTH OF RAYMOND ROLLER MILLS
PULVERIZING PHOSPHATE ROCK

COMBUSTION ENGINEERING, INC.
Raymond Division

1307 North Branch St.
CHICAGO 22, ILLINOIS

SALES OFFICES IN PRINCIPAL CITIES

Combustion Engineering-Superheater Ltd., Montreal, Canada

Enter 1323 on Reader Card

Labor Relations *continued from page 28*

Are three violations of rules enough to fire a man?

What Happened: In a period of 6 months, Jack Kerr committed 3 violations of rules. The first one netted him a 3-day layoff. This was for negligence which resulted in some damage to equipment. The second one, for absenteeism, got him a stiff warning. The third, for loitering, convinced the company that he was not the kind of employe they wanted to have, and Jack was fired. He felt that the final penalty was too stiff, and argued at an arbitration hearing that:

1. None of the offenses, when taken separately, were serious enough for discharge.
2. Plenty of employes had been punished for similar missteps, but had not been given the "death penalty."

The company saw it another way. It agreed that none of the individual violations were serious enough for discharge. But the man's record, taken as a whole, indicates that he is a poor employe. Management does not have to put up with constant violations of rules even though each one may not be serious enough for discharge.

Was the company:
Right? ☐ Wrong? ☐

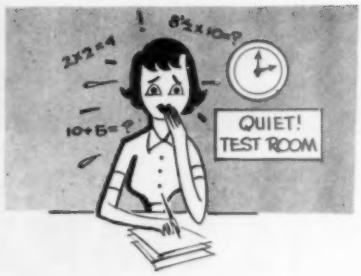
What Arbitrator Carl A. Warns, chairman, ruled: "The fact that two men may make the same mistake and receive different punishment does not mean that the company is discriminating—it may mean that one man, by his record, his intelligence and attitude, has convinced the company that he has 'slipped up.' The other man, by his record of prior mistakes, may convince the management that he lacks ability to do the work. The company can consider the man's record AS A WHOLE to support its judgment on discipline. In this instance, the company did just that, and I cannot say that Mr. Kerr was discriminated against. The discharge stands."

Can an employe refuse overtime work?

What Happened: During the busy season, it was the practice of the company to schedule Saturday as an overtime day, and employes were expected to come in on those days. The union contract provided that employes would be required to work a reasonable amount of overtime. Suddenly, Mrs. Anthony started being absent on Saturdays, claiming that she couldn't come in because of family responsibilities. She was warned twice, and when she persisted in being absent, she was fired. The union, representing her at the arbitration, claimed that overtime is a voluntary act, and employes cannot be disciplined for refusing to put in extra hours. The company rested on its management right to schedule the hours of work, and that such right included the requirement that employes put in reasonable overtime.

Was the company:
Right? ☐ Wrong? ☐

What Arbitrator Hill ruled: "The company has an unlimited right to schedule hours, including a longer or a shorter week than the usual 40 hours. Further, the right to schedule longer hours has quite generally been held to carry with it the right to require performance of overtime work. If management is empowered to schedule the working hours, it must follow that management may require performance of the work. Mrs. Anthony's discharge was for just cause."



Can you use a test to deny a promotion to an employe?

What Happened: When a job opened up in the shipping department, Alice Newmark felt sure she would get the promotion because the company had a policy of promoting from within on the basis of "seniority and job requirements." But when she made formal application, the supervisor told her that she would have to take a test in arithmetic because the job called for "ability to do simple calculation."

Alice took the test, and failed. The job was given to a junior employe. Alice complained:

1. I know the work on that job. I filled in many times and made out all right.
2. I want a chance to prove myself on the job. I'm entitled to a trial period.

The company sympathized with Alice's situation, but felt it couldn't change the rules to fit one employe. It had always given a test for that job, and had used the results exclusively to decide who was to be promoted.

Was the company:
Right? ☐ Wrong? ☐

What Arbitrator Harry J. Dworkin ruled: "The crux of the case is whether the company had the right to deny the grievant the job solely by reason of her failure to pass an examination testing her proficiency in simple mathematics. The use of tests is properly a supplement to other personnel evaluation tools and techniques. Thus, the test should not be used alone as a means for evaluating the employe unless such a condition is specifically spelled out in company policy. In this case, it is not. The policy of the company does not include 'ability to pass a test' as a requirement, but merely 'seniority and requirements for the job.' The employe should be given a trial in the job—particularly where the company is safeguarded through the probationary period. Also, if the employe doesn't make the grade on the job, the test results will be strong evidence in favor of the company's judgment. Alice Newmark should be promoted on a trial basis." **END**

New **Longer-Wearing** Pattern in Wire Rope Styles!

After three years of extensive field trials this, the newest of Roebling's wire ropes, is now ready to go to work for you on a service basis that will exceed that of *the wire rope you are now using*.

Roebling Herringbone* combines the best features of both regular and Lang lay rope constructions; being made up of two *pairs* of Lang lay strands and two strands of regular lay. The regular lay strands separate the two pairs of Lang lay strands. Thus, in one rope you have the superior flexibility and abrasion resistance of Lang lay and the greater structural stability of regular lay.

For the past three years, under all kinds of conditions, Herringbone has been used for general hoisting, holding and closing lines, shovel ropes, wagon scraper ropes and dragline ropes. The results have been wonderful . . . excellent flexibility, exceptional resistance to shock and abrasion, smooth, easy operation around drums and over sheaves, smooth spooling properties and structural stability unequalled by other rope for the same job.

There has never been a better time—or a wider need—for a wire rope that returns so much service for its cost. And, in addition to being a top performer on the job, Herringbone eliminates the necessity of stocking Lang lay for one purpose and regular lay for another.

You are invited to get in touch with your Roebling distributor or write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for further and fuller details on the *investment* qualities of this new and highly serviceable rope.

*Reg. appl. for

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PEOPLE

IN THE NEWS

Operations vice president

CYRUS C. ADDAMS has been promoted from production manager to vice president in charge of operations of the Marblehead Lime Co., Chicago, Ill., subsidiary of Material Service Corp. Mr. Addams, who has been production manager since 1953, started his career in the lime industry in 1936.

A. J. Wetzel named treasurer

ARTHUR J. WETZEL, purchasing agent and director of employe relations and manager of safety and welfare, San Antonio Portland Cement Co., San Antonio, Texas, has been elected treasurer, succeeding H. C. Schroeder who passed away May 23.

Alpha plant engineer

CHARLES R. SMITH, JR., formerly assistant superintendent at the Ironton, Ohio, plant of Alpha Portland Cement Co., Easton, Pa., has been appointed plant engineer at the Lime Kiln, Md., plant. Mr. Smith joined the Birmingham plant in 1954 and became superintendent at Ironton in 1956.

Safety director

GILBERT ARCHER has been appointed safety director for Marble Cliff Quarries Co., Columbus, Ohio. Mr. Archer resigned from the Ohio Division of Mines to accept this position.

Mr. and Mrs. Fred Coppock honored by Californians

SOUTHERN CALIFORNIA Rock Products Association and Southern California Ready Mixed Concrete Association, their directors and wives honored Mr. and Mrs. Fred Coppock at a dinner party in the Sierra Room of the Statler Hotel, Los Angeles. Sixty guests attended to pay tribute to Mr. Coppock, chairman of the board of directors of American Aggregates Corp., Greenville, Ohio.

Robert Mitchell, president of Consolidated Rock Products Co., acted as master of ceremonies, introducing each of the directors and their wives. He related the history of Mr. Coppock as a producer of sand and gravel, beginning in 1900, and traced the growth of the various organizations which Mr. Coppock created as the business grew in volume.

Mr. Coppock told of the beginning of his operations and strongly emphasized the need of rehabilitation of exhausted gravel properties into useful and beautiful recreation centers. He stated that the producers should be alert to their responsibilities to the public in general and place themselves in the position of benefactors to the community in which they operate.

Many honors have been bestowed upon Mr. Coppock for his great service in public relations. He was named the leading citizen in his own community and in the state of Ohio.

PCA manager

FRANK E. CATTO has been appointed manager of public relations in the Lansing, Mich., office of the Portland Cement Association, Chicago, Ill. He was formerly director of industrial development of the Detroit & Mackinac Ry. Co.

Dravo research director

ROBERT HUGHES has been appointed director of research and development of Dravo Corp., Pittsburgh, Pa., replacing W. L. Newhall, who has retired after 33 years of service. Dr. John A. Anthes has been named assistant director of research and development activities.

Mr. Hughes was born in England and joined Dravo in 1945 and most recently served as engineering manager of the engineering works division. Dr. Anthes, who joined Dravo in 1953, previously was a process engineer in the engineering and construction department of the machinery division. He is a graduate of the University of Minnesota, Minneapolis, Minn., with a Ph.D. degree.

Gypsum purchasing agent

ROBERT G. RUNKEL, formerly division buyer in the Chicago office of the United States Gypsum Co., has been appointed division purchasing agent and will be in charge of the new southwest purchasing office in Galena Park, Texas.

Sales manager retires

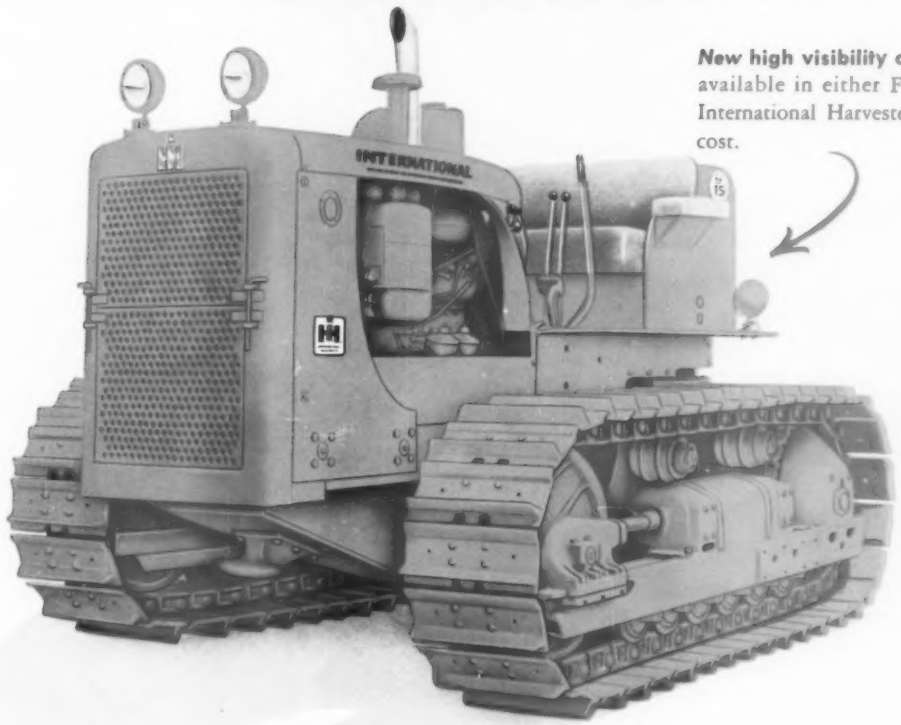
WILLIAM A. CAVANAUGH has retired as sales manager of the Buffalo Crushed Stone Corp., Bowmansville, N.Y., after 39 years of service. He will be succeeded by Robert F. Buyers.

A native of South Buffalo, Mr. Cavanaugh joined the company in 1919 as a shipping clerk when the firm operated the old La Salle quarry in North Buffalo. He was made vice president and sales manager in 1944.

(Continued on page 37)

NEW International® TD-15 tops 100-hp field...

with exclusive power and control features!



***New* high visibility color.** Optionally available in either Federal yellow or International Harvester red at no extra cost.

NEW

6-cylinder diesel power . . . 105-hp fully-proven D-554 engine—full 20,500 lbs drawbar pull.

NEW

6-speed full-reverse transmission . . . 20% higher reverse speeds. A speed for every work or travel need plus fast "Shuttle-Bar" direction changing!

NEW

Precision control
Foot Decelerator for instant speed changes—fast "Shuttle-Bar" forward-reverse travel.

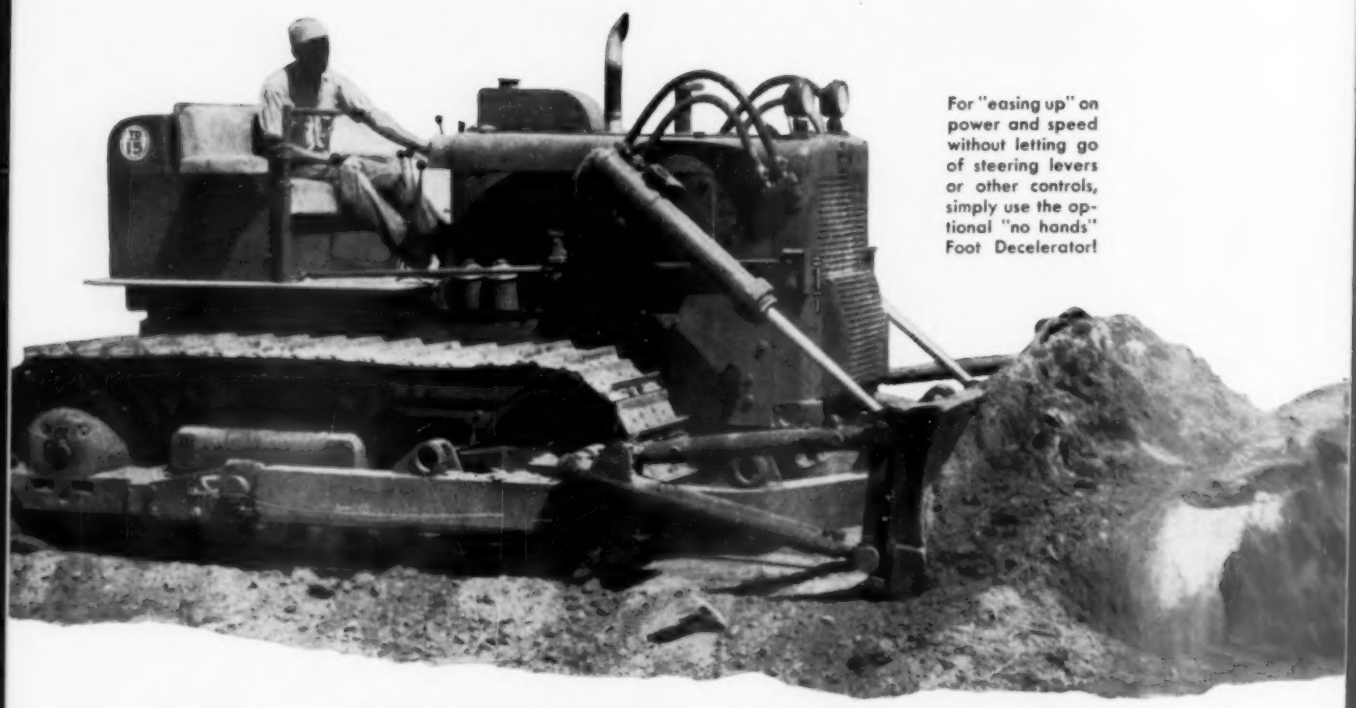
NEW

1,000-hour lube interval, heavy-duty track rollers
. . . heavy-duty, long-life bushing type, with extra capacity lube reservoir.

...and here's the pay-off for you...

You move in on...and speed up

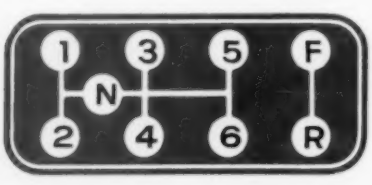
....with NEW TD-15



For "easing up" on power and speed without letting go of steering levers or other controls, simply use the optional "no hands" Foot Decelerator!

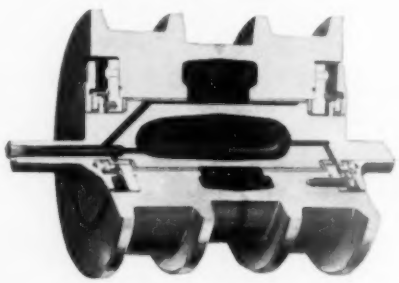
Exclusive six-speed "single stick" shift... forward and reverse "Shuttle-Bar"

You shift through all six speed ranges of the new TD-15—forward or reverse—with a single lever. Shift pattern is planned for gear-changing ease and speed with a fast sweep of the hand—to give you instant use of the speed you need. To speed the work-cycle and take full advantage of fast shifting, you simply push or pull the "Shuttle-Bar"—to change TD-15 forward or reverse instantly.



1,000-hour lube interval, heavy-duty, track rollers

Not just another "claim" . . . International now combines heavy-duty *bushing design*, exclusive cartridge-type *metal-to-metal seals*, and king-size lube reservoirs, to offer the industry the first heavy-duty type roller as standard equipment on the TD-15. Thick shells for safe build-up and exclusive pressure relief passages for flush-out and prevention of seal damage from power lubricators are part of this new design.



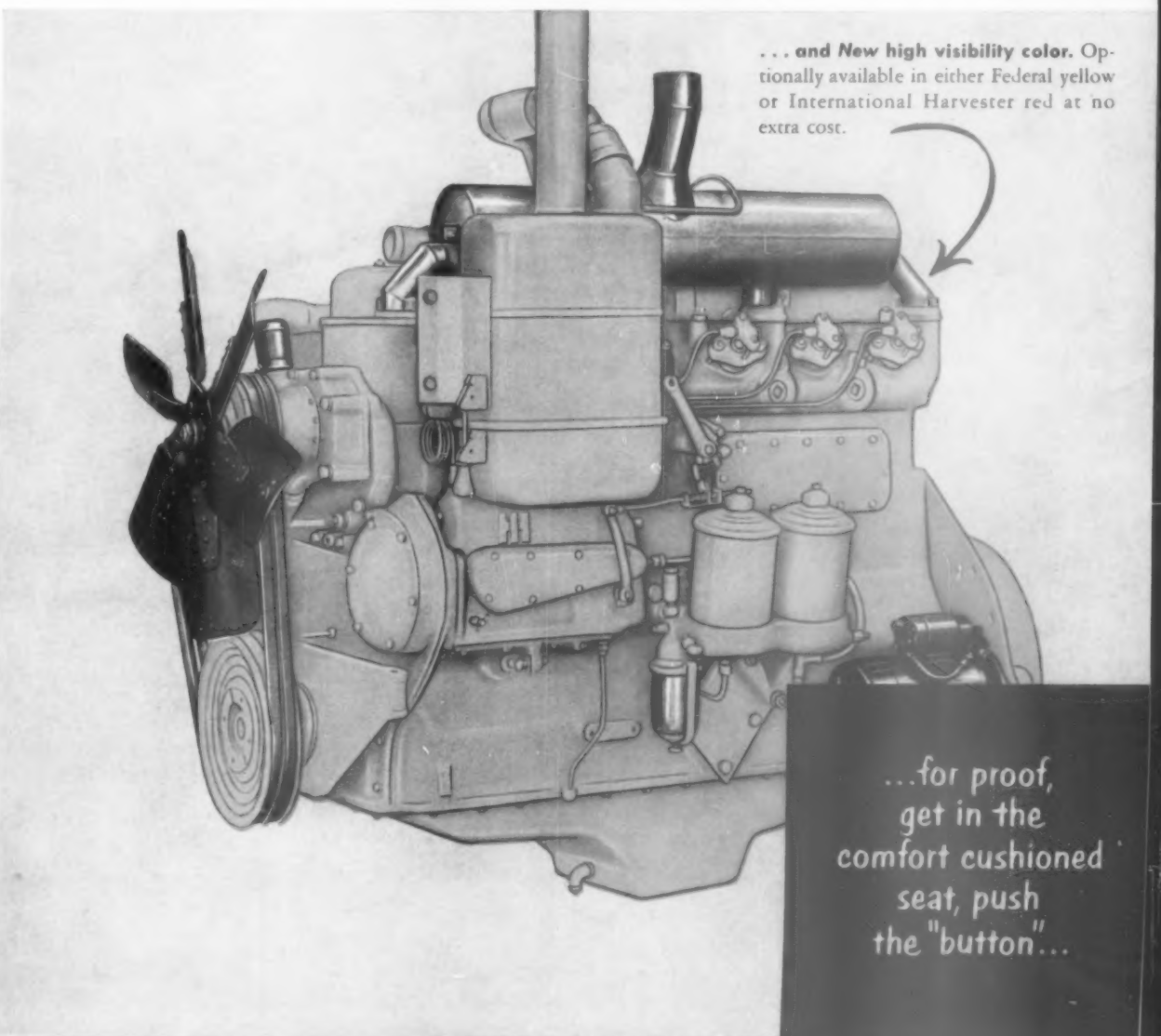
...a whole new range of jobs...

capacity and control

Smooth 6-cylinder... BIG 105 IH diesel horsepower

You get 6-cylinder smoothness from this new International D-554 diesel engine that powers the new TD-15. This fully-proven power plant produces its 105 net hp at 1,650 rpm . . . features famous International 45-degree angle operation full-flow lubrication, closed pressurized cooling, exclusive twin plunger pump fuel injection system, fully counter-balanced crankshaft, positive valve rotators, and all-weather gasoline conversion starting. Here's an engine built for long life, big-capacity output!

New power, strength, control, and reliability features like these show you how and why the 105-hp TD-15 tops its field. You move in on a new range of heavy jobs—material-moving, land-clearing, hauling, loading, excavating, logging, mining—that no longer belongs to next-size-bigger crawlers!



. . . and *New* high visibility color. Optionally available in either Federal yellow or International Harvester red at no extra cost.

...for proof, get in the comfort cushioned seat, push the "button"...

Compare TD-15 performance to anything *in the 100 hp crawler field!*

Prove to yourself you can move in on, and speed up, a whole new range of heavy jobs—with new TD-15 capacity and control. Put the TD-15 through its paces—compare *power*, *speed*, *capacity*, and *control* to anything else on tracks in the 100 hp field. The 6-speed full-reverse transmission and "Shuttle-Bar" will show you on-the-job how fast, easy, and profitable shuttle-cycle operations can be! Press the decelerator and see what a helper this feature can be for actually speeding up operations—by reducing declutching and shifting time! Measure sintered metal, dry-type clutch full power transfer efficiency and maintenance, ease and economy to any other crawler's clutch—wet or dry! See your International Construction Equipment Distributor for a new TD-15 demonstration!

International® Construction Equipment

International Harvester Co. • 180 N. Michigan Ave. • Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

PEOPLE IN THE NEWS

(Continued from page 32)

Transportation director

WILLIAM T. DAVIDSON has been promoted to director of transportation for National Gypsum Co., Buffalo, N.Y. Formerly general traffic manager, he succeeds Robert F. Mackrell, who has retired after 32 years of service. Harry B. Polson has been named general traffic manager, succeeding Mr. Davidson.

Mr. Davidson has been general traffic manager since 1949. He joined National Gypsum in 1937 as supervisor of trucking. He was manager of water transportation from 1945 to 1948 when he was appointed director of administrative planning. During World War II he served as assistant to the general manager of the Bluebonnet, Texas, ordnance plant which the company operated for the federal government.

Mr. Mackrell, an expert in railroad freight rate negotiation and adjustment, joined National Gypsum in 1926. He was honored recently at a luncheon attended by transportation leaders from many parts of the nation. Melvin H. Baker, chairman of the board, headed a group of executives who paid tribute to the retiring transportation director.

Mr. Polson has been associated with the transportation department since 1934. A native of Buffalo, he is a graduate of Technical High School and the old Hurst Business College.

A. L. Rossiter retires

ADOLPH L. ROSSITER has retired as assistant traffic manager in the Kansas City, Mo., office of the Universal Atlas Cement Division, U. S. Steel Corp., New York, N.Y., after 48 years of service. A native of Pittsburgh, Pa., Mr. Rossiter began his career with Universal Atlas in the Pittsburgh office in 1910. He was transferred to Kansas City in 1939 as the cement division's traffic representative, and in 1946 was appointed assistant traffic manager at Kansas City.

Wyandotte treasurer

GEORGE W. SCHWARZ has been named treasurer of Wyandotte Chemicals Corp., Wyandotte, Mich., in addition to his duties as vice president and general manager of the general products division. Donald R. Hibbert, director of accounting, has been appointed controller and assistant treasurer of the corporation.

Assistant to vice president

DANIEL L. ZIEGLER has been appointed assistant to the vice president of operations, Alpha Portland Cement Co., Easton, Pa. He was formerly project manager, supervising construction of the new cement plant at Lime Kiln, Md. Mr. Ziegler joined Alpha in 1922 as plant engineer at the Catskill, N.Y., plant. He was made maintenance engineer in 1946 and eastern division superintendent in 1948. He is a graduate of Lafayette College, Easton, Pa., with a B.S. degree in mechanical engineering.

ARBA appoints Russell public relations director

T. RANDOLPH RUSSELL has been appointed director of public relations for the American Road Builders' Association, Washington, D.C. He succeeds Robert L. Smith, who died September 3. Mr. Russell resigned his position as press and research assistant to Senator Strom Thurmond (D-S.C.) to join the ARBA. A graduate of Furman University, Greenville, S.C., Mr. Russell previously served 11 years as a newspaperman in Augusta, Ga.

Sayre & Fisher directors

CHARLES FOSTER BROWN, Dr. Adam S. Borst and Herbert G. Braasch have been named to the board of directors of Sayre & Fisher Co., Sayreville, N.J. Mr. Brown is senior partner in the law firm of Brown & Hunter. Dr. Borst is vice president and director of the Broadmoor Corp. and a director of the Park Sheraton Corp. Mr. Braasch is a member of the board of Vacuum Concrete Corp., Philadelphia.

Max Koffman retires

MAX A. KOFFMAN, senior vice president and director of the Southwestern Portland Cement Co., Los Angeles, Calif., has retired after 51 years of service. Mr. Koffman started his career in the cement industry in 1907 as timekeeper at the El Paso, Texas, plant, advancing through the years to the position of senior vice president. He was active in civic affairs, serving as a director of the Los Angeles Chamber of Commerce and as vice president for two years. He also served as vice president and member of the board of the Merchants and Manufacturers Association.

St. Lawrence Cement names traffic manager

L. A. KOEPKE has been named traffic manager of St. Lawrence Cement Co., Clarkson, Ontario, Canada. Mr. Koepke has had 12 years' experience in the field of industrial traffic management, and served two years as president of the Kitchener Traffic Club.

Maule promotions

NEILSON JONES has been appointed general manager of the northern division of Maule Industries, Inc., Miami Beach, Fla., in addition to his duties as divisional vice president of the Palm Beach division. Maurice Ferre has been named research engineer; Robert Pike, supervisor of general accounting; and W. H. Bruninga, administrative assistant to the treasurer.

U. S. Gypsum sales managers

JACK P. VAN GELDER has been appointed sales manager of the Central Pacific Division of United States Gypsum Co., Chicago, Ill., with headquarters in San Francisco.

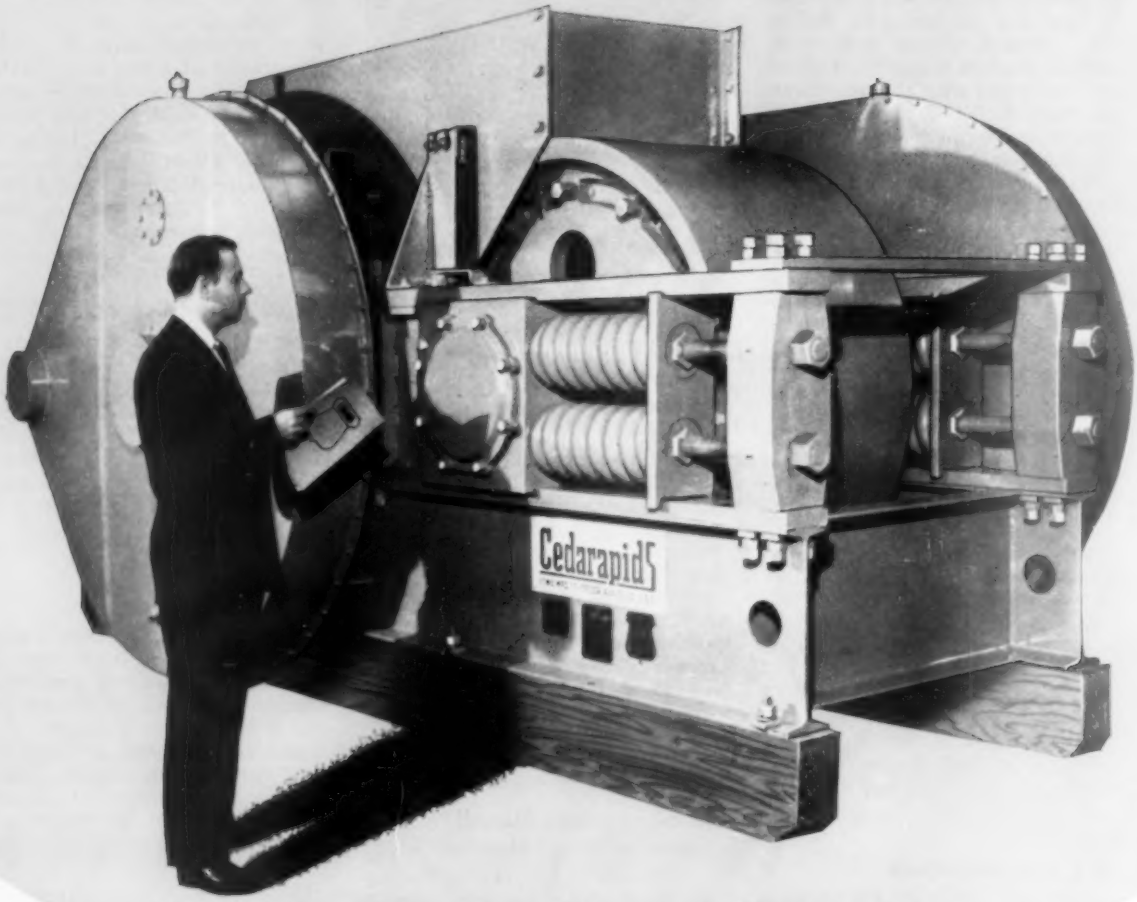
A graduate of the University of California in Los Angeles, Mr. Van Gelder was formerly U. S. Gypsum district manager in Oakland, Calif., and will be succeeded by William E. Nilson, a graduate of the University of California, who has been serving as a salesman in the Oakland district.

Sales representative

DEAN L. SKAUGSTAD has been named sales representative in southern Minnesota for Hawkeye-Marquette Cement Co., Des Moines, Iowa. He succeeds C. L. Mullen, who has retired after 30 years of service.

(Continued on page 39)

You're tons ahead with this BIG
CEDARAPIDS 5530 ROLL CRUSHER



These big-performance features tell you why

Big Secondary Production of material from ¼" to 5" pours steadily through this big roll crusher with its 30" wide rolls, to keep aggregate plants operating at a highly profitable pace. The big 55" diameter rolls nip into larger size feed material—as a result, the primary crusher can be opened to increase over-all plant capacity.

Low Maintenance assures big profit. Every feature of the 5530 Roll Crusher is engineered to give steady high production day-in and day-out for month after month. To take the stress of crushing, bearings are designed for extremely heavy-duty service. Extra-heavy countershaft assures steady, high capacity even under surge loads. Rugged frame is engineered with high-strength steel I-beams and welded crossbeams to hold countershaft bearings, gear and pinion, and stationary roll bearings in rigid alignment. You get high-tonnage output day after day from the Roll Crusher that's built to take punishment!

Extra Power, with large, heavier-than-average flywheels turning at high speed on an extra-heavy-duty counter shaft, easily handles surge loads due to uneven feeding . . . and gives this Cedarapids Roll Crusher the most economical power consumption rate per ton of material crushed.

More Efficient Feeding also steps up production. Material is dropped *between* the rolls. Its speed of falling permits maximum penetration into the crushing area, allowing faster feeding and resultant greater hourly output. A special feed box with an angle divider spreads material across the full width of the rolls to utilize the entire crushing area and prevent uneven wear on the roll shells.

Other job-proved features include: Patented shear plates that protect the crusher from uncrushable material without resorting to numerous heavy springs; extra-rugged spider cores for roll shells; easy shim adjustment for rolls; a wide range of roll shell surfaces including smooth, corrugated, or beaded.

Cedarapids
Built by IOWA

IOWA MANUFACTURING COMPANY Cedar Rapids, Iowa, U.S.A.

PEOPLE IN THE NEWS

(Continued from page 37)

Universal Atlas managers

FRANK J. WEAVER has been named assistant plant manager at the Fairborn, Ohio, plant of the Universal Atlas Cement Division, U. S. Steel Corp. Formerly power foreman at the plant, he succeeds Robert P. Jarrett, who has been appointed assistant plant manager at Independence, Kan.

Mr. Weaver, a native of Florida, Ohio, is a graduate of the U.S. Merchant Marine Academy, Kings Point, Md., where he received a B.S. degree in marine engineering. He joined the Fairborn plant in 1948 as assistant power foreman and in 1952 was promoted to power foreman.

Mr. Jarrett has served as assistant plant manager at Fairborn since 1955. Prior to that he served for seven years at the Independence plant as a practice engineering trainee, engineering trainee and project engineer. He is a native of Temple, Okla., and a graduate of the University of Oklahoma, Norman, Okla., with a B.S. degree in civil engineering.

Marquette superintendent

DAVID G. LEWIS has been named quarry superintendent of the Superior, Ohio, plant of Marquette Cement Manufacturing Co., according to an announcement by Frank Moyle, vice president and director of operations. Mr. Lewis was formerly manager of the Ottawa, Ill., aggregate plant of Material Service Corp., Chicago. A native of Ohio and a graduate of Ohio State University, Columbus, Mr. Lewis has had wide experience in mining and quarrying operations.

Lake Ontario president

GEORGE H. ELLIOTT has been appointed president, general manager and a director of Lake Ontario Portland Cement Co., Ltd., Picton, Ontario, Canada. Born and educated in Canada, Mr. Elliott was formerly vice president of the Gustin-Bacon Manufacturing Co., Kansas City, Mo., and has had wide experience in production, marketing, sales, engineering and finance.

National Gypsum promotion

LEONARD L. HANK has been appointed vice president of operations for National Gypsum Co., Buffalo, N.Y., and will be in charge of all plants, mines, and quarries, in addition to the purchasing, transportation, engineering and plant industrial relations divisions. Formerly vice president in charge of manufacturing, Mr. Hank succeeds Wells F. Anderson who passed away September 21.

A native of Cincinnati, Mr. Hank is a graduate of the University of Cincinnati College of Engineering. He joined National Gypsum in 1946 as manager of the Kalamazoo paper plant. In 1950 he was promoted to production manager and four years later became general production manager for the gypsum, paper and insulation board plants. He has been vice president in charge of manufacturing since 1956. END

OBITUARIES

Manuel H. Fidalgo, vice president-engineering for Maule Industries, Inc., Miami, Fla., died suddenly on October 1. He was 47 years of age. A native of Puerto Rico, Mr. Fidalgo graduated from Rensselaer Polytechnic Institute, Troy, N.Y., with a degree in mechanical engineering. He joined Maule Industries in 1955 as a vice president after serving several years with the Water Resources Authority of Puerto Rico.

James G. Sennett, district manager of the Clifton, N.Y., branch of United States Gypsum Co., Chicago, Ill., died suddenly while attending a business conference at the firm's midtown offices. He was 52 years old.

Henry David Mayenschein, retired general superintendent of the Fairborn, Ohio, plant of Southwestern Portland Cement Co., Los Angeles, Calif., died September 23 at his home in Sarasota, Fla., where he had resided for the past two years. He was 72 years old. A native of Ironton, Ohio, Mr. Mayenschein joined Southwestern in 1925 as an engineer, retiring in 1956.

Burton B. Pierce, retired structural engineer, Seattle, Wash., died September 15 at the age of 89. Born in Clairmont, N.H., Mr. Pierce moved to Seattle in 1918. He built and operated cement plants in Concrete and Grotto, Wash., and Orofino and Inkum, Idaho. At one time he was superintendent of Roach Harbor Lime and Cement Co.

Robert L. Smith, public relations director, American Road Builders' Association, Washington, D.C., died suddenly September 3 while on vacation near Homestead, Fla. He was 47 years old. A native of Sardinia, N.Y., Mr. Smith had been with the Association since 1953, when he became editor of the *American Road Builder,* official magazine of the Association, and handled public relations. For the past year he was editor of the ARBA *Newsletter.* Mr. Smith was director of information for the State and Local Officials' National Highway Safety Committee in Washington, D.C. for two and one-half years prior to joining the American Road Builders' Association. In 1952 he also was an administrative assistant to the President's Highway Safety Conference.

Wells F. Anderson, Sr., vice president of operations and a director of the National Gypsum Co., Buffalo, N.Y., died September 21 after an extended illness. Born in Tomah, Wis., Mr. Anderson received his B.A. and M.A. degrees, also a doctorate in geology, from the University of Wisconsin. He was associated with the U. S. Gypsum Co., Chicago, Ill., for 18 years and served as manager of the Winston plant in Nova Scotia, prior to joining National Gypsum Co. in 1951 as production manager. He was promoted to vice president of manufacturing in 1954 and vice president of operations and a director in 1956.

Dr. Oliver Bowles, internationally known geologist, mining engineer and authority on non-metallic minerals, passed away on August 1 at his home in Virginia. He was 81 years of age. Associated with the U. S. Bureau of Mines for over 44 years, Dr. Bowles served as chief of the non-metals division from 1942 until his retirement in 1948. He was author of "The Stone Industries," "The Lime Industry," and the chapter on lime for the Minerals Yearbook. In 1948 Dr. Bowles was awarded the Distinguished Service Award of the United States Department of the Interior.

Nerl Rinehart, assistant superintendent of maintenance at the Monolith, Calif., plant of Monolith Portland Cement Co., Los Angeles, died October 5. He was 51 years old. A native of Illinois, Mr. Rinehart had lived in Bakersfield for the last 23 years.

Thomas C. Taylor, general traffic manager of Ideal Cement Co., Denver, Colo., died September 16 following a seven-week illness. He was 76 years old and had been general traffic manager since 1941.

INDUSTRY NEWS

Black Lake asbestos facility goes into operation

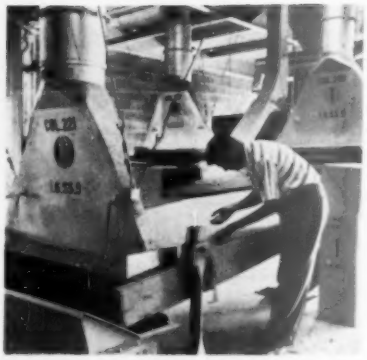
A $36-MILLION ASBESTOS producing facility at Black Lake, Quebec, was formally opened October 16 by Lake Asbestos of Quebec, Ltd., a wholly owned subsidiary of American Smelting and Refining Co. More than 250 industrial leaders and the business press from Canada and the United States, as well as community officials and representatives of the Canadian government, braved steady rain to attend the opening.

Government speakers pointed out the importance of asbestos to Canada's economy as one of its principal exports, and company officials emphasized the importance of their product to modern technology. Robert D. Bradford, president of Lake Asbestos of Quebec, Ltd., and vice president and director of Asarco, declared that the new operation "demonstrates what can be accomplished by pooling Canada's natural resources with the resources of American business, and as an unusual engineering achievement, it shows clearly the advantages of combining the engineering skills of both nations."

Ore chute leading to primary crusher

Shakedown operations at the mine and mill started late last summer. Production now is on a full commercial scale. With the opening, 10 percent has been added to Canadian production of asbestos fiber, and 7 percent to the free world's supply.

Open pit mining operations are expected to yield 100,000 tons of asbestos yearly for 20 years; after that, underground mining probably will be necessary. The whole operation can handle 1,350,000 tons of ore each year. The $9-million mill houses ultra modern equipment to free asbestos fiber from the ore and to grade, dry and prepare fiber for shipment. There are special buildings for the crushing of the ore as mined and for storage of ore during processing. Conveyors link the buildings and many operations are guided by electronic remote control systems. Serving mine and mill are an electric substation, repair shops, garages, offices and railway spur.



Separating asbestos fiber from ore

New Dewey cement plant to serve Tulsa area

DEWEY PORTLAND CEMENT CO., Kansas City, Mo., announced that it was exercising options to acquire approximately 1,500 acres of land near Tulsa, Okla., preparatory to building a new cement plant. Extensive core drilling on the land, four miles east of the city, has shown adequate reserves of high quality stone, and a test run of the stone at the company's Dewey, Okla., plant proved satisfactory.

In the announcement, made by Dewey President Waldo E. Tyler, it was disclosed that engineers are studying the exact location of the plant on the site, trackage, etc. Plans, drawings and specifications are being prepared, utilizing the most modern and efficient design and handling equipment. Initial capacity will be approximately 1,250,000 bbl. annually; cost has been estimated at $10 to $12 million.

The newly acquired site is near quarries presently operated by Chandler Materials Co. and Standard Industries, Inc., suppliers of building materials. It is on the main line of the Frisco Railroad.

Sand plant moves; equipment is updated

KAISER SAND & GRAVEL DIVISION, Henry J. Kaiser Co., Oakland, Calif., will move its Felton, Calif., sand processing plant, announces R. S. Barneyback, vice president and general manager. The modernized operation will be set up on a 296-acre site three miles from the present plant, where production capacity will be the same as formerly—350,000 tpy. of coarse sand. Water separation tanks will be installed for grading the sand, replacing agitation screens.

Funkhouser Co., latest Ruberoid acquisition

RUBEROID CO., New York, N.Y., has announced the acquisition of Funkhouser Co. of Hagerstown, Md. Assets of Funkhouser Co., as well as those of its selling agent, R. J. Funkhouser Co., are being acquired for shares of Ruberoid stock.

A producer of roofing granules and mica, Funkhouser operates quarries in Fairmount and Hartwell, Ga., and in Charmian and Delta, Pa. It will be operated as a Ruberoid division, with headquarters in Hagerstown.

American-Marietta expands research facilities

AMERICAN-MARIETTA CO., Chicago, Ill., announces the construction in Cleveland Heights, Ohio, of a new research and development laboratory for its Master Builders division. Together with adjacent new office quarters, it will be ready for occupancy late in 1959.

During the last 50 years, Master Builders has pioneered in developing

(Continued on page 42)

NEW DESIGNS IN CATERPILLAR EQUIPMENT AND PARTS DEPEND ON CREATIVE USE OF HIGHEST QUALITY STEEL

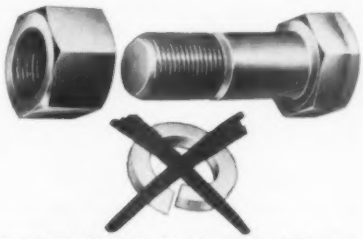
Example: Track hardware, made of stronger pre-tested steel and "Hi-Electro" hardened, stays tight without lock washers, often lasts through two sets of shoes

How much does it cost to pull a tractor off a job to tighten or replace track hardware? It costs plenty, in down time and in service time. That's why Caterpillar's new track hardware is such a good investment.

Caterpillar hardware normally stays tight without the use of lock washers throughout the service life of the first set of track shoes. And, exclusive "Hi-Electro" hardening of dome-shaped bolt heads often permits bolts to be used for a second set of shoes.

Most track hardware looks pretty much alike, but there's a big difference in quality. Steel, for instance. All steel for Caterpillar's new track bolts has a minimum tensile strength of 151,000 pounds per square inch, well above the SAE standard of 120,000-140,000.

The special steel accepted for track hardware is furnace-heated, quenched and tempered to toughen the entire bolt against breaking,



ELIMINATION of lock washer is feature of Caterpillar's new track hardware.

bending and the permanent stretching that leads to loosening of the nut.

Carbon, lost from the surface area in mill rolling and heat treating, is restored by Caterpillar with a carefully controlled, carbon-atmosphere process. Then threads are "rolled" into the bolt, curving the natural flow lines to follow the thread contours, producing threads that are highly resistant to stripping.

The large dome-shaped head receives an exclusive deep and even "Hi-Electro" hardening. This protects the hexagonal corners from mushrooming. Wrenches fit onto Cat bolts after many hundreds of hours of hard use.

This same quality of material, design and manufacture is found in *all* Caterpillar parts. And they're always available at your Caterpillar Dealer. See him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

SERVICE TIP

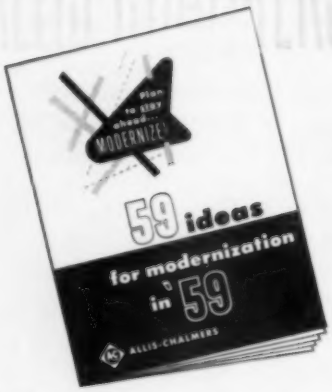
A torque wrench should always be used to tighten track hardware to factory-recommended torque values. Your Operating and Maintenance Instructions give exact values for each tractor model.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

TENSILE STRENGTH of a bolt is tested in Caterpillar Laboratories. Each bolt is capable of supporting the full weight of the tractor for which it is designed.

DON KOPP, Master Mechanic, McCann & Co., Inc., Springfield, Ill.: "We're real boosters of genuine Cat parts, especially track parts. Other brands just don't last as long. When you buy Cat parts you know they are going to fit, last longer and give the best service because they are built to do the job by the people who built the machines."



NEW brochure of ideas for modernizing

This booklet is based on the premise that modernization can start anywhere in your plant. It can be a single machine or operation . . . a better way of getting variable speed . . . a faster way to braze . . . or a newly available replacement. In fact, this type of updating is far more common than the sweeping change.

Get a copy of "59 ideas for modernization in '59" from your nearby A-C office or write Allis-Chalmers, Industries Group, Milwaukee 1, Wisconsin.

New motor development may eliminate premiums you've been paying for specially protected motors.

Electrical modernization includes placing substations close to machines being served.

ALLIS-CHALMERS

A-5850

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INDUSTRY NEWS

(Continued from page 40)

new products and methods for improving concrete and mortar. One of its products is Pozzolith, the cement admixture. More than 150 million cu. yd. of Pozzolith concrete have been used in the construction of buildings, dams, bridges and other concrete structures.

In building the new laboratory, American-Marietta is carrying out its policy of reinvesting more than half of its annual earnings in growth activities. More than four percent of all A-M personnel are now engaged in developing new products or improving existing ones.

Mica production sidelined by minerals discovery

GEOLOGIST CECIL T. WELCH, core drilling for mica near Toronto, Kans., determined that the area did have economic mica deposits, lying between 700 and 850 ft. The drilling also turned up evidence of ore bodies of magnesium and potassium at shallower depths, so he and his associates plan to mine and sell these metals first, with mica as the next target.

Mr. Welch said that analysis of the cuttings shows the magnesium content of the earth to be mined is 221 lb. per ton; potassium is 46 lb. per ton. These ores lie at various depths from 95 to 750 ft. They will be mined at a rate of 50 tpd. Tailings will be stockpiled for recovery of the rare earths present in the deposits.

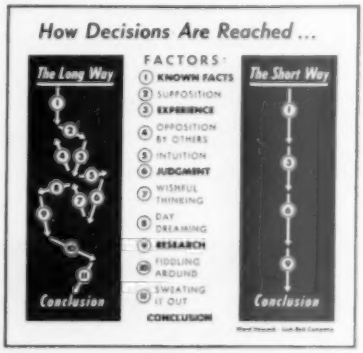
Portland cement production

PRODUCTION OF FINISHED portland cement in August, 1958, as reported by the Bureau of Mines, totaled 31,675,000 bbl., an increase of 1 percent over the year-earlier figure. Mill shipments for the month were 34,189,000 bbl., a decrease of 3 percent compared with August, 1957, while stocks of 27,889,000 bbl. of finished portland cement on hand August 31, 1958, represented an increase of 39 percent over stocks on hand a year before. Clinker production totaled 27,907,000 bbl., a two-percent increase over August, 1957. These figures were provided by 162 plants in 37 states and Puerto Rico.

Jensen is host to Russian engineers

ELLIS E. JENSEN, president of Janesville Sand and Gravel Co., Janesville, Wis., was host to Russian engineers visiting the United States as part of an exchange program. Keen interest was shown in the operation of the Janesville plant by K. S. Radin, vice minister of agriculture in the Ukraine, and G. L. Smirnov, engineer of electrical mechanization in the Russian ministry of agriculture.

The men were part of a Soviet delegation of six participating in the Russia-United States agricultural exchange program. The purpose of their visit was to study and observe the construction of agricultural buildings, use of electricity on the farm and supply of electricity to rural areas.



Orders placed for plant equipment

DUNDEE CEMENT CO., Dundee, Mich., has placed orders for major plant equipment and is scheduling start of operations for January 1, 1960. According to J. Hiltemann, chief of the engineering department, two kilns of the double dumbbell type—15 and 16.6 ft. diam. x 460 ft. long—have been ordered from F. L. Smidth Co. Nordberg Manufacturing Co. is building two raw and three finish grinding mills, each 12 x 36 ft. The mills will be driven by 2,500-hp. synchronous motors from GE.

One high-speed, 20-ton bucket crane with 150-ft. span will be supplied by Milwaukee Crane; it will be equipped with Westinghouse's Load-o-matic and React-o-verse control.

Two electrostatic precipitators, silicon rectifiers and automatic transistor voltage controls are being built by Buell Engineering Co., and Fuller Co. is supplying two 10 x 70 ft. horizontal grate coolers. Electrical equipment, said Mr. Hiltemann, is being delivered by General Electric Co.

(Continued on page 44)

FIRST

NOW — Allis-Chalmers Vibrating Screens

FLOAT ON AIR

NEW cars, modern trucks and trains utilize air springs for the smoothest, best controlled ride obtainable. Now Allis-Chalmers has applied the *same type air springs to vibrating screens* to provide greatly improved screen performance.

For complete information, see your nearby A-C representative, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis. Ask for Bulletin 07B8931.

A-C ALLIS-CHALMERS

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(Continued from page 42)

Lightweight aggregate—coal firm's next venture

CLINCHFIELD COAL CO., Clinchfield, Va., a division of Pittston Co., has scheduled construction of a $1.5-million lightweight aggregate plant as part of a $20-million expansion program. The whole venture includes construction of Moss No. 3 mine and a coal preparation plant described as one of the world's largest. Raw material for the aggregate, to be named Clinchlite, will be the shale washed from coal in the preparation plant.

Propose mill to process Mexican fluorspar ore

DOW CHEMICAL CO.'S SUBSIDIARY, La Domincia, S. A. De C. V., will begin construction soon on a new 100-tpd. capacity fluorspar mill in Mexico. The mill site is alongside the Rio Grande River 1½ miles downstream from Las Vegas De Stillwell. Acid grade concentrate will be produced from ore mined in open pit deposits 25 miles from the mill. Shipping terminal will be at Marathon in Brewster County, Texas, where connection will be made with the Southern Pacific Railroad.

AED meets next month

ASSOCIATED EQUIPMENT DISTRIBUTORS, an association of construction and industrial equipment engineers engaged in the application and maintenance of that type of equipment, will hold its 40th annual meeting in Chicago, Ill., January 25-29. All scheduled events will be held at the Conrad Hilton Hotel. General business meetings will be open to both distributors and manufacturers, with the four sessions featuring speeches and panel discussions about industry problems.

Park Taylor Thorssen Willson Kennedy

Expanded Shale sessions concentrate on research

THE EXPANDED SHALE CLAY AND SLATE INSTITUTE, holding its sixth annual meeting in Kansas City, Mo., devoted most of its three-day program to discussions of research studies covering all phases of masonry and structural concrete. These included prestressed concrete. Several new programs are proposed for the coming year.

Co-hosts of the meeting, Carter-Waters Corp. and Buildex, Inc., arranged for members and guests to visit their plants in the Kansas City area and Ottawa, Kans. Representatives from 29 of the 36 producing plants attended, including four Canadian plants.

Frank G. Erskine, managing director of the Institute, outlined events and accomplishments of the past year. Otto Frei, president for two years, turned over the gavel to Allan Taylor of Kenlite, Louisville, Ky. Other newly elected officers are Cedric Willson, first vice president, L. A. Thorssen, second vice president and Les Kennedy, secretary. Ben Park is treasurer.

New members welcomed into the Institute were: Acolite, Springfield, Minn.; Clayburn-Harbison, Ltd., of Abbotsford, B.C.; Material Service Corp., Chicago, Ill.; Norlite Products Co., Spokane, Wash.; Rescolite, Fort Smith, Ark.; Winnipeg Light Aggregates Ltd., Winnipeg, Manitoba. Two additional plants of members were put on the membership list.

The Cooksville Co., Ltd., Toronto, will be host at next year's meeting. Their expanded shale operation is one of the oldest in the world, having been in existence for more than 30 years.

Blast damages Calaveras laboratory, offices

CALAVERAS CEMENT CO., San Francisco, Calif., sustained explosion damage at its San Andreas cement plant. The blast occurred in the new $300,000 administration and laboratory building, destroying 40 percent of the interior and injuring five persons. After a preliminary check, officials said a hot water heater used in the radiant heating system may have blown up, causing the damage.

Earle Bagley, superintendent of raw materials at the plant, and Fenton Bolton, a physical tester, were hospitalized for injuries. Three others, Mitch Becich, geologist, Irvine Lytle, chemist, and John Kennedy, assistant purchasing agent, were treated for injuries but were not hospitalized.

It was conceded to be fortunate that the toll of injuries was not much higher—Mr. Bagley's office was demolished as he sat at his desk and the adjoining office of Joseph Kiley, safety engineer, also was demolished. Mr. Kiley had left it moments before.

Plant conforms to air pollution law

NATIONAL GYPSUM CO.'S plant in New Haven, Conn., not only meets the requirements of that city's air pollution ordinance, it exceeds them, said Eric W. Mood, director of the city's Bureau of Environmental Sanitation.

When National Gypsum bought the New Haven operation of Connecticut Adamant Plaster Co. last year, installation of dust control equipment had already been started. However, the original plan was expanded. The equipment consists of two Pangborn dust collectors, each with 2,350 sq. ft. of collecting area, and a Research-Cottrell electrostatic precipitator with a capacity of 33,000 cfm.

(Continued on page 48)

Plan to stay ahead... MODERNIZE!

Specification Sand

from rock, aggregate or natural sand with an

ALLIS-CHALMERS ROD MILL

Here's the economical way to get specification sand, *where and when you want it*. An Allis-Chalmers rod mill will process rock, coarse aggregate or unusable natural sand into specification sand of ideal cubical texture. This equipment will extend the life of natural deposits and eliminate the expense of long-haul shipments.

Specification Reliability and Flexibility

The Allis-Chalmers rod mill holds its adjustment to specification with very little attention. Changing specifications is merely a matter of changing feed, feed-water rate, or rod charge.

"Manufacturing" sand is a particularly tough, abrasive operation, but the Allis-Chalmers rod mill is built to withstand this rugged service. It's been proved the most economical machine for grinding sand — in terms of long life and low operating costs.

Contact your A-C man for details, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis., for Bulletin 07B6718A.

A-5847

ALLIS-CHALMERS

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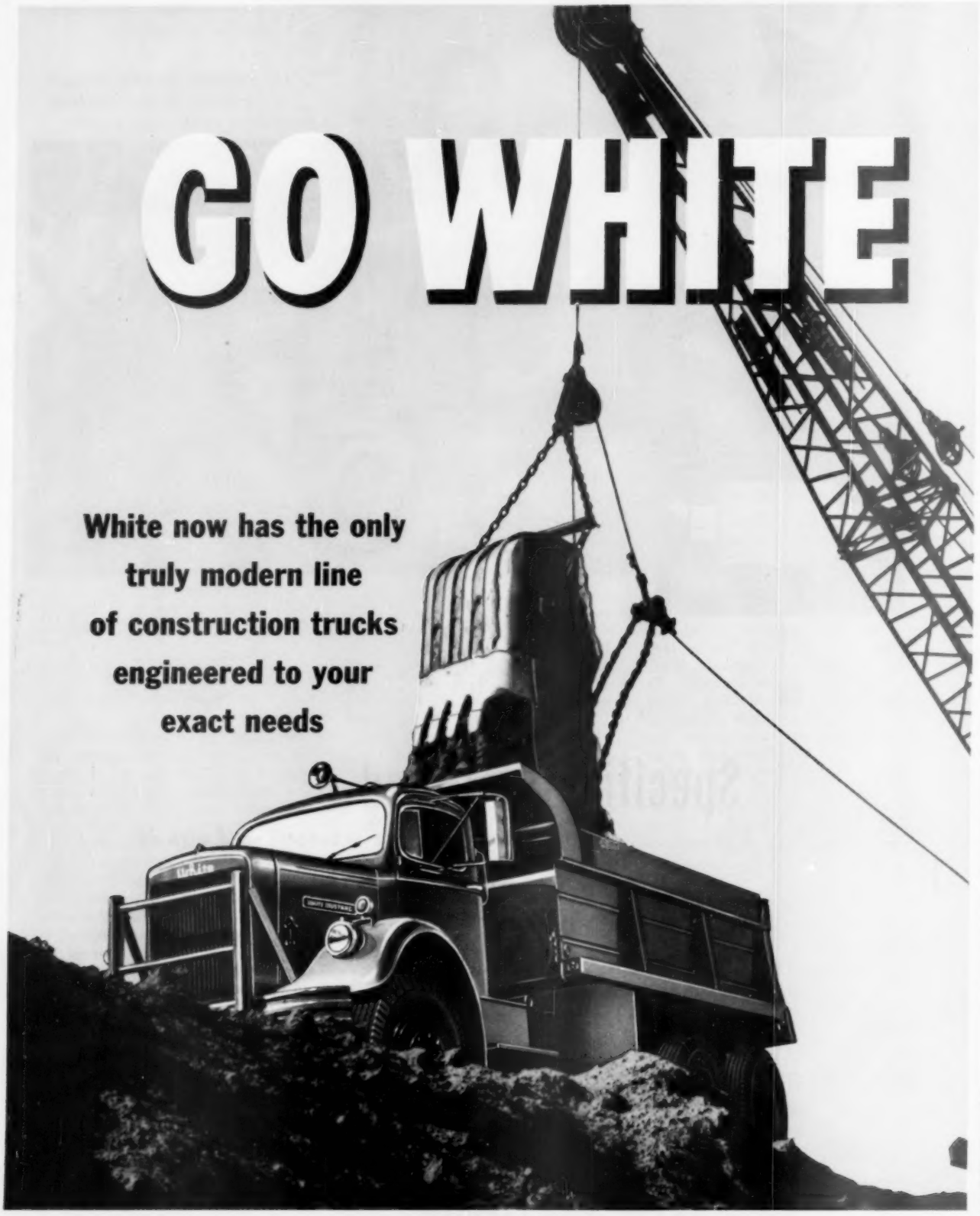

WHITE . . . The Truck That Knows Your Business

for rugged strength-dependability-bigger payloads

★ **WHITE *REALLY HAS THE FRAME!***

The White construction frame is really heavy duty—engineered for the rugged jobs. Built to stand tough treatment and rough going for more years. Double channel frame of chrome manganese heat treated steel means up to 40% greater strength. Bolted construction—a real White advantage!

★ **WHITE *DELIVERS THE BIG PAYLOADS!***

Ideal weight distribution and excellent dimensions of White Construction Tandems mean more work—better schedules—more earning power. The 90-inch dimension (front of bumper to back of cab) permits maximum CA with minimum wheelbase.

★ **WHITE *HAS EXTRA-CAPACITY UNITS!***

Husky rear axles with ample capacity and best suspension permit excellent articulation, maximum strength and bigger payloads. Wider tread of the extra-capacity White front axle means outstanding maneuverability and real time savings.

★ **WHITE *HAS THE POWER!***

Efficient, rugged White Mustang Power assures dependability for even the toughest schedules. Front power take-off has adequate capacity for all types of mixer drive. White Engines are quality-engineered for more work.

THE WHITE MOTOR COMPANY
Cleveland 1, Ohio

White

. . . Greatest Name in Trucks

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THE RIGHT SCREEN FOR YOUR JOB!

Are you faced with a really tough problem in sizing . . . scalping . . . washing . . . rescreening . . . dewatering? The *right* Hewitt-Robins screen is your answer!

Vibrex: Here's the most versatile screen of them all! Simple, field adjustable, stroke, speed, angle to match any requirement . . . circle-throw principle with two massive self-aligning bearings . . . rock-bottom economy coupled with long-life ruggedness!

Eliptex: Exclusive elliptical motion for horizontal operation gives high capacity, fast material progression, and sharp sizing.

Gyrex: This positive-stroke, four-bearing, circle-throw screen has an unsurpassed record for stamina.

hi-G: A modified-resonant unit that has the extra kick for hard-to-screen materials at only a fraction of usual power requirements. Both decks are accessible for cloth changes.

All 4 in standard *suspended* and *base mounted* models!

Whatever your specific screening problems, you will find one of these Hewitt-Robins units *best* fitted for the job. For information or service, contact your local H-R representative, or Hewitt-Robins, Stamford, Connecticut.

HR HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS . . . POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

H-R Product Manufacturing Plants in Buffalo, N.Y. • Chicago, Ill. • King of Prussia, Pa. • Passaic, N.J. Amsterdam, Holland • Johannesburg, South Africa • London, England • Montreal, Canada • Paris, France

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INDUSTRY NEWS

(Continued from page 44)

Statistics released on gypsum production

THE U. S. BUREAU OF MINES has compiled producers' reports indicating that the declining output of the gypsum industry in 1957 paralleled the trend of residential construction. However, its reports for the first two quarters of 1958, also currently available, show an increase in production over the year-earlier periods.

For 1957, output of crude gypsum totaled 9,194,580 short tons, 11 percent below 1956. Of the 61 mines producing, 43 were open pit, 15 were underground and 3 were a combination of the two types. Fifty-seven plants produced 7,800,000 tons of calcined gypsum from domestic and imported ore, 9 percent less than in the previous year.

Producers reported stocks of crude gypsum totaling 2,313,000 short tons on hand December 31, 1957, compared to 2,265,000 tons on the same date the previous year.

Domestic mine production of crude gypsum during the first quarter of 1958 totaled 2,378,210 short tons, 19 percent greater than the tonnage reported for the first quarter of 1957. Imports totaling 745,767 short tons were 2 percent lower than in 1957. Output of calcined gypsum increased slightly over the first quarter of 1957, whereas uncalcined gypsum products declined 13 percent, primarily because of a 20-percent decline in the demand for cement retarder.

Second-quarter production of crude gypsum in domestic mines was 2,860,126 short tons, 21 percent greater than in the second quarter of 1957. Output of calcined gypsum was 5 percent lower.

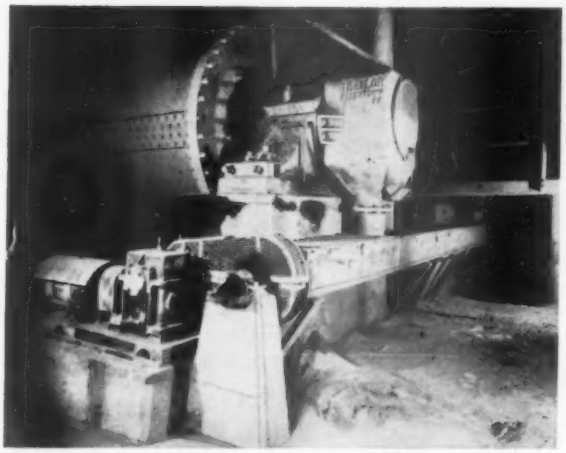
Marquette reporting scores first again

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., again has taken first honors in the cement industry for excellence in annual reporting. Its president, W. A. Wecker, received a bronze "Oscar of Industry" at the *Financial World* awards banquet.

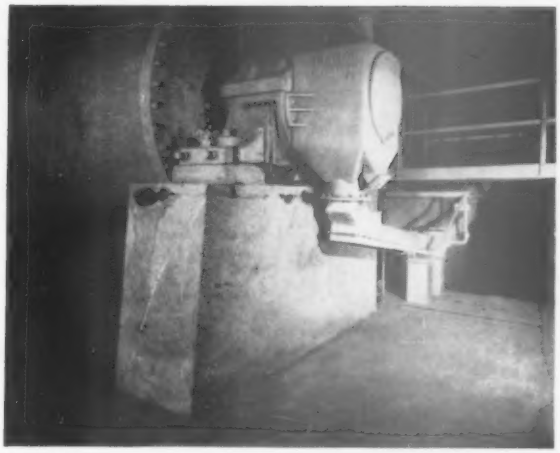
This is the nineteenth such award Marquette has won, including two gold Oscars for best of all annual reports and three silver ones for the best of all manufacturing company reports. In the competition for the cement industry's best annual report for 1957, Permanente Cement Co. was runnerup and Lehigh placed third.

(Continued on page 51)

The Arithmetic of Materials Handling



BEFORE: **Dirt, noise and mechanical breakdown** were constant problems in this cement plant, where two mechanical conveyors were used to collect raw materials. A 5 h.p. motor driving auxiliary equipment wasted valuable space and power, required frequent maintenance. Spillage clean-up wasted costly man-hours.



AFTER: **Clean, simple, quiet.** Notice the difference two 8" F-H Airslide® fluidizing conveyors have made. No dangerous moving parts. Nothing to lubricate. Auxiliary equipment and foundations are gone. Power needs are now only 1/8 of previous needs. Fluidizing saves wear and maintenance.

AIRSLIDE® Fluidizing Conveyor

minimizes material loss . . . maintenance . . . moving parts

If you are now handling dry, pulverized materials, the F-H Airslide Fluidizing Conveyor can help you stop noise, and air-pollution, as well as speed flow and reduce maintenance cost.

Simplicity Itself

F-H Airslides fluidize dry, pulverized materials with low pressure air.

These materials literally flow at high speed, down the inclined conveyor. Power requirements are small.

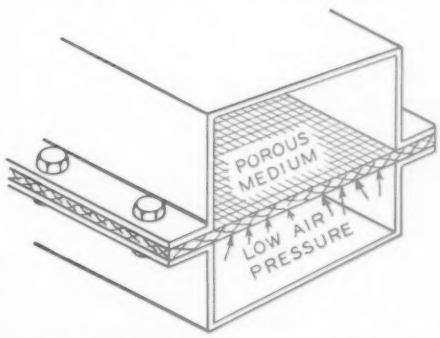
Flexibility, Low Cost

For unlimited applications, Airslide conveyors take up little space, and can be used singly and in combination with other Fuller pneumatic conveying systems. The movement of fluidized material can be around corners, between floors, through walls—nearly any conveying distance.

Better Housekeeping

Can Fuller conveying systems help eliminate your housekeeping problems—cut your maintenance and handling costs? Write today, outlining your problem in handling dry, finely-divided materials. Fuller will gladly make appropriate recommendations.

"Pulverized Materials Flow Like Water!"



AIRSLIDE PRINCIPLE: Porous supporting medium divides conveyor section into two "compartments". Dry material flows down inclined conveyor, fluidized by low-pressure air entering beneath porous medium.

FULLER COMPANY GENERAL AMERICAN TRADE MARK

Fuller . . . . pioneers in harnessing AIR

FULLER COMPANY
102 Bridge St., Catasauqua, Pa.
SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION
Birmingham • Chicago • Kansas City • Los Angeles • New York • San Francisco • Seattle

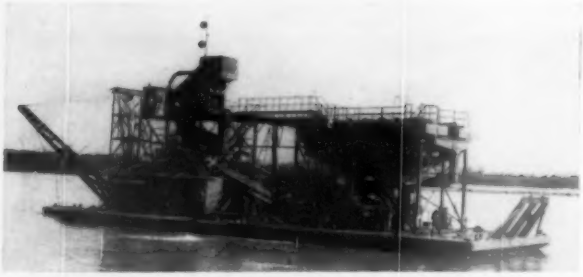
4483
FH 59

"See Chemical Engineering Catalog for details and specifications".

Enter 1202 on Reader Card

Still Another Customer Speaks About

—Tells Why He's CHANGED HIS MIND!



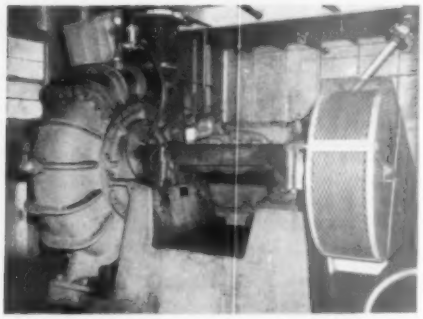
Federal Materials Company dredge at Paducah, Kentucky.

The FEDERAL MATERIALS Company

PLANTS — CAPE GIRARDEAU, MO. · PADUCAH, KY. · METROPOLIS, ILL.

PADUCAH, KENTUCKY

Note: Mr. Hely once thought our claims on performance of THOMAS DURABLE DREDGE PUMPS were "exaggerated." We are publishing his letter in type form to make it easier for you to read—and understand why HE CHANGED HIS MIND. No other comment from us is necessary!



Thomas Durable Dredge Pump on Mr. Hely's dredge.

"Approximately one year ago we put in operation a complete new dredge for the production of sand and gravel for our Paducah, Kentucky plant.

"On this dredge we installed a Thomas Pump having 12" intake and 10" discharge. This is our first use of a Thomas Pump. Our previous experience had been with various makes of dredge pumps. Prior to using a Thomas Pump we thought some of the claims made by your sales personnel on what the pump would do rather fabulous and exaggerated. After one years use of the pump we know these claims to be unexaggerated and quite modest.

"The head on our new dredge is approximately 14 feet higher than any head we have previously pumped against and our Thomas Pump is giving us a much better production and more gallons per minute than we have ever experienced previously. We are easily averaging 300 tons per hour of specification sand.

"After one years operation we have not lost one minute or had a moments trouble with this pump. We have not dismantled the pump as our production at the present time is not noticably different than the first month the pump was operated. We recently were required to replace a section of discharge pipe right over the pump and in replacing this we had a very good view of the flukes on the impeller of this pump and were very surprised that the wear shown on these flukes was very negligible. From our past experience with dredge pumps we know that any pump we have used in the past would in this length of time require the replacement of several thousand dollars in worn parts."

Very truly yours,
THE FEDERAL MATERIALS COMPANY
Norman L. Hely, President

We will be glad to send you photostatic copy of Mr. Hely's letter above, dated July 17, 1958, and descriptive literature on Thomas Pumps—available in sizes 6" through 16"

THOMAS FOUNDRIES Inc.

P. O. Box 1111, Birmingham, Alabama

Enter 1294 on Reader Card

Pumps

"FABULOUS AND EXAGGERATED" CLAIMS PROVED TO BE "UNEXAGGERATED AND QUITE MODEST"! !

The Reasons: -

1 ALL WEARING PARTS MADE OF GENUINE DEPENDABLE THOMAS NI-HARD.

2 EXTREMELY RUGGED.

3 BUILT-IN HIGH EFFICIENCY.

Thomas Foundries in its own plant produces the best of abrasion metals suitable for pump construction.

- NI-HARD, THE DEPENDABLE VARIETY.
- HIGH CHROME IRONS, T-27.
- MANGANESE STEEL CASTINGS.
- CAST IRON.

DOES ANY OTHER PUMP COMPANY PRODUCE AND CONTROL ALL THESE MATERIALS IN ITS OWN FOUNDRY?

THOMAS PUMP USERS ARE THOMAS BOOSTERS

INDUSTRY NEWS

(Continued from page 48)

Campbell drivers cut accidents by 42 percent

HARRY T. CAMPBELL SONS' CORP., Towson, Md., tallied a 42-percent reduction in motor vehicle accidents in the second year of its company-sponsored safety contest. Fifty-eight Campbell drivers finished two years of safe driving, and 36 were one-year winners.

Here is the way the contest works:

1. Contest year is Aug. 1-Aug. 1.
2. Cash credits are built up each month that a driver completes a month without a chargeable accident.
3. The cash credit starts at 50 cents the first month and increases with each succeeding month, which enables a driver to receive $37.50 for driving one year without a chargeable accident. In addition, each driver with a year's perfect record receives a specially-designed card acknowledging his driving skill.
4. An additional amount ($5) is added for each consecutive year a driver completes without a chargeable accident with a top limit of $50.
5. In case of a chargeable accident, the driver loses the cash credit for the month in which the accident occurred and starts over again the next month at the 50-cents-per-month rate.

(Continued on following page)

Calendar of Coming Conventions

1959

January 19-21, 1959—
National Agricultural Limestone Institute, 14th Annual Convention, Hotel Statler, Washington, D.C.

January 21-22, 1959—
National Crushed Limestone Institute, 4th Annual Convention, Hotel Statler, Washington, D.C.

January 27-30, 1959—
National Crushed Stone Association, 42nd Annual Convention, Bal Harbour Area Hotel Group, Miami Beach, Fla.

February 2-6, 1959—
American Society for Testing Materials, Committee Week, Penn-Sheraton Hotel, Pittsburgh, Pa.

February 15-19, 1959—
National Sand and Gravel Association, 43rd Annual Convention, Hotel Roosevelt, New Orleans, La.

April 6-8, 1959—
National Lime Association, Annual Convention, Homestead, Hot Springs, Va.

April 23-25, 1959—
Texas Aggregates Association, 5th Joint Annual Convention With TRMCA, Shamrock Hilton Hotel, Houston

June 21-26, 1959—
American Society for Testing Materials, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N.J.

September 13-18, 1959—
American Society for Testing Materials, Third Pacific Area National Meeting, Sheraton Palace Hotel, San Francisco, Calif.

September 27-30, 1959—
National Sand and Gravel Association, Semi-Annual Meeting, Board of Directors, Lake Placid Club, Lake Placid, N.Y.

(Continued from preceding page)

Murray Sand Co. ships first carload

MURRAY SAND CO., Murray, Ky., a new industry set up to process high purity silica sand, shipped its first carload, destined for a Corning Glass Co. plant, late in October. State and local community and industrial development officials looked on with interest as machinery started up, turning out the first shipment. There was a brief dedication ceremony.

The raw material source for the operation is a deposit described as having unusual purity, and estimated at 20 million tons.

Flintkote purchases firm; seventh in two years

FLINTKOTE CO., New York, N.Y., in buying Orangeburg Manufacturing Co., is making its seventh acquisition in two years—its fourth in 1958. Announcement of the transaction has been made by I. J. Harvey, Jr., Flintkote chairman, and H. J. Robertson, president of Orangeburg. It involves exchange of $13.2 million of a new class of Flintkote stock for all the assets and business of Orangeburg.

Bituminized fiber sewer and drain pipe and electrical conduit are manufactured by Orangeburg Manufacturing Co. at its plants in Newark, Calif. and Orangeburg, N.Y.

Dust collectors installed at Ideal's Mobile plant

IDEAL CEMENT CO., Denver, Colo., is installing dust collection equipment at a cost of $1 million at its Mobile, Ala., plant. Electrostatic precipitators and a 200-ft. high stack comprise the additions to the six-kiln plant. The work is scheduled for completion early next year.

Drummond Dolomite acquires new deposits

WHEN ITS PROPOSED $2,500,000 expansion program is completed within the next three years, this processing plant of Drummond Dolomite, Inc., DeTour, Mich., can draw upon newly acquired reserves estimated to contain 150 million tons. Curt Knoblock, general manager, announced the company's launching of the program to construct a railroad linking the deposits with the plant site, and preparation of the area for full production.

The deposits cover a 2,700-acre tract in the Huron Bay area on the south shore of Drummond Island, Mich., six miles east of the plant. Clearing of timber has begun and the engineering firm of Walter H. Knapp, Inc., Milwaukee, is making surveys for location of the railroad.

Drummond Dolomite now processes ten sizes of crushed stone for the metallurgical, chemical and construction fields at the rate of 2.5 million tpy. The plant was moved from Sturgeon Bay, Wis., in 1944.

Potash production

PRODUCTION OF MARKETABLE potassium salts in the United States during the first half of 1958 totaled 1.9 million short tons containing 1.1 million tons of K_2O equivalent, according to the Bureau of Mines. Stocks in producers' hands at the end of June remained at a high level, nearly 800,000 tons of salts containing over 470,000 tons of K_2O equivalent.

Vehicle registrations up

MOTOR-VEHICLE REGISTRATIONS will total 68,398,000 by the end of this year, predicts the Bureau of Public Roads. This is an increase of two percent over 1957, and prompts an observation from Robert M. Koch, executive vice president of National Crushed Limestone Institute: "Obviously, as more and more vehicles are using the roads, provisions must be made to both maintain and expand the present highway system."

No sand shortage at Minneapolis–Janes

FRANK JANES, president of Arsenal Sand and Gravel Co., Minneapolis, Minn., thinks that sand and gravel for Minneapolis' growth are available in almost unlimited supply. His firm has completed production facilities on its 93-acre property near New Brighton which he estimates may produce as much as 40 million tons. Plant capacity is 150 tph.

Test probes by the E. J. Longyear Co. have proved a continuous supply of pure gravel and rock to a depth of 250 ft. or more. A 2,000-gpm. capacity well provides water for washing material at the plant, described as one of the most modern in the Upper Midwest region.

Fourteen acres of high land adjoining the site also have been acquired by the company. This land will be available for lease to industries using gravel and allied products, such as hot-mix asphalt and ready-mix concrete plants.

(Continued on page 57)

Newfoundland asbestos development planned

ADVOCATE MINES, LTD., Toronto, Canada, will be joined by four other companies in a program to develop an asbestos ore body on its property in northern Newfoundland. M. J. Boylen, president of Advocate Mines, said the program will take $1 million.

The funds will be made available by the investor group which includes Canadian Johns-Manville Co., Ltd., Patino, Ltd., of Canada, Amet Corp., Inc., and Financiere Belge de L'Asbestos-Ciment, S.A. This group also will supply the funds to build a 3,000-tpd. capacity mill.

The fiber will be sold by Advocate when commercial production starts in three years. Johns-Manville, which operates asbestos mines in Quebec and northern Ontario, has contracted to manage and operate the Newfoundland project. The other members of the development group are representatives of manufacturers in Europe and other areas outisde the U. S. who use large amounts of asbestos fiber.

New motor development obsoletes today's application practices!

Only from Allis-Chalmers!

***Super-Seal* motors save up to 60%**

Here's an amazing advance in motor technology! It's the *Super-Seal* motor line—an open motor design so completely unaffected by moisture, dust, dirt, oil, acids and alkalies that it can be used in many applications previously requiring more costly enclosed motors. *Savings range from 15 to 60%.*

Super-Seal motor superiority results from two distinct revolutionary insulating techniques. Available in any integral horsepower size, smaller *Super-Seal* motors incorporate a *Poxeal* stator. A durable epoxy resin encloses the stator, creating an electrical system impervious to outside elements.

In larger sizes, *Silco-Flex* insulation is used. In this system, silicone rubber is vulcanized into a homogeneous mass to form a flexible, moisture and heat resistant, void-free dielectric barrier around coils and leads.

Both of these insulation systems are unsurpassed. Proof? An encapsulated motor ran for hundreds of hours at full load in a 4% brine solution.

Find out more by reading the next pages; then contact your A-C representative or distributor, or write Allis-Chalmers at address shown on back page.

ALLIS-CHALMERS

518 9100

CHRYSLER KIMBERLY-CLARK GOODYEAR

Two revolutionary insulating techniques developed and pioneered by Allis-Chalmers mean savings of millions of dollars for motor users . . .

New open motors are unaffected by moisture and contaminants

Modern insulating materials and new methods of application, now available in *Super-Seal* open-type motors, are drastically changing motor application standards. These insulations are so completely impervious to moisture and contaminants that *Super-Seal* open motors can be used in most applications formerly requiring costly enclosed designs. Existing applications have resulted in savings as high as 60%.

Basic insulation systems

Larger *Super-Seal* motors with form-wound stator coils use the *Silco-Flex* insulation system. Heart of this system is a remarkable rubber-like silicone elastomer, applied in semi-cured state and vulcanized to form a void-free, impervious dielectric barrier. More than four years of development and field testing have proven the superior electrical and physical properties of *Silco-Flex* insulation systems.

Stator coils of smaller random-wound motors are protected by equally effective *Poxeal* insulation system. A tough, durable case of epoxy resin completely seals the winding end turns and slot portions. Bonded to the stator laminations, it forms a seal completely impervious to contaminants.

Moisture resistance

In addition to being void-free, the silicone elastomer used in *Silco-Flex* insulation is moisture repellent. Even in high humidity, moisture does not form a surface film of condensation. Coils with this protection can operate completely immersed in water. In fact, one of the recommended cleaning procedures is use of detergent and water.

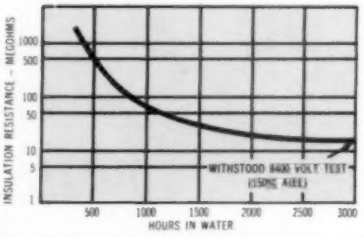


Fig. 1—Test curve shows insulation resistance of *Silco-Flex* insulation while immersed in water.

Moisture resistance of *Silco-Flex* coils is demonstrated in Fig. 1. After more than 3000 hours of total immersion with 2300 volts impressed on the coil, the test was terminated when it became apparent that little more drop could be expected in the coil's insulation resistance. At that point the coil still withstood a high potential test of 8400 volts without injury.

Encapsulated stator windings are equally well sealed. Motors with *Poxeal* insulation protection have been thoroughly tested under water while operating with full load and full voltage.

Resistance to contaminants

Silicone elastomers and epoxy resins are relatively inert to attack by practically all reactive agents. Further, the void-free construction of insulation systems used in *Super-Seal* motors prevents penetration of contaminants. As a result, *Super-Seal* motors are unaffected by oils, most acids, salt solutions, alkalies, and oils and are ideally suited for such applications.

Thermal stability

Temperature-wise, *Silco-Flex* insulation can easily withstand hot-spot temperatures of 200 C and more—

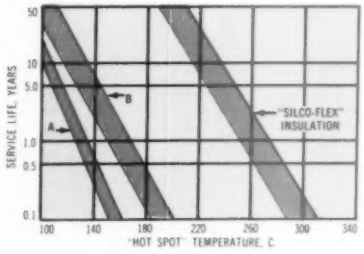


Fig. 2—Chart shows that *Silco-Flex* insulation more than meets Class H requirements.

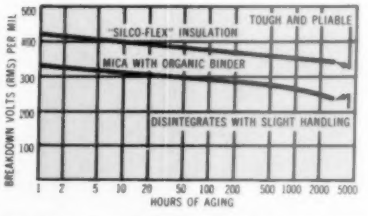
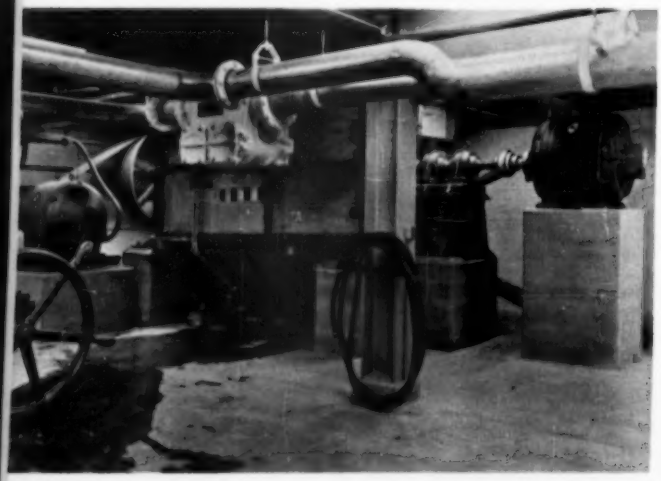


Fig. 3—Tests of 2300-volt insulated bars show thermal stability of *Silco-Flex* insulation.



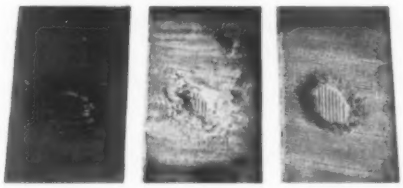
Paper mills have wide application for *Super-Seal* motors because of moist atmospheres.

easily meeting Class H temperature requirements (Fig. 2). At temperatures where the life of Class B coils would be measured in weeks, the life span of *Silco-Flex* coils is well beyond machine obsolescence.

Comparison with a mica-organic binder insulating system (Fig. 3) offers further proof of thermal stability. After 2000 hours of aging at 200 C with 8500 volts applied continuously, the *Silco-Flex* insulated coil was still tough, pliable, and completely serviceable. The mica-taped insulation had deteriorated to the point where it disintegrated readily and was completely useless.

An added advantage of *Silco-Flex* insulation is unusually high thermal conductivity — about twice that of conventional insulations. This means heat dissipates faster from its point of generation.

Poxeal insulation also demonstrates remarkably good thermal stability. Materials now in use are suitable for Class B temperatures, although actual classification of the insulation is determined by the basic material used.



Silco-Flex Insulation | Polyester Mica Tape | Asphaltum Mica Tape

Fig. 4—Samples of motor insulations after sandblasting give comparison of abrasion resistance.

Abrasion resistance

Resistance to abrasion is still another point of superiority in the insulation systems used for *Super-Seal* motors. Abrasion resistance of *Silco-Flex* insulation is compared to other types of insulation in Fig. 4. After one minute of sandblasting with 90-grit aluminum oxide and 100-psi air, only slight surface erosion appeared on the *Silco-Flex* sample. Other insulations were eroded to bare copper.

Application practices obsolete

The superior qualities of *Super-Seal* insulating systems, developed by Allis-Chalmers, make it necessary to reappraise present application practices. With virtually ageless insulation, *Super-Seal* motors assure more reliable service and require less upkeep than the best protected, conventionally insulated machines — and at considerably less cost.

Super-Seal, Poxeal, and Silco-Flex are Allis-Chalmers trademarks.

CHRYSLER KIMBERLY-CLARK GOODYEAR SOUTHERN CEMENT CONTINENTAL CAN SCOTT PAPER AMERICAN OIL CELOTEX HURON PORTLAND CEMENT FORD FIRESTONE PACIFIC GAS & ELECTRIC STANDARD OIL OF INDIANA B. F. GOODRICH DOW CHEMICAL MARLEY INGERSOLL-RAND LINK-BELT

WIDE ACCEPTANCE

of Super-Seal motors proves their advantages

Cement, petroleum, chemical, steel, mining, paper, utilities, municipalities and general industry — outstanding corporations in every field are specifying *Super-Seal* motors wherever operating conditions are tough.

Cost and *superior insulation* aren't the only reasons. Users are getting MORE MOTOR, too. Here's why:

Standard totally-enclosed motors, 55° C rise, have a *service factor of 1.* In other words, "nameplate" horsepower is the maximum. A 40° C rise *Super-Seal* motor with *Poxeal* insulation, and a 60° C rise *Super-Seal* motor with *Silco-Flex* insulation have a *service factor of 1.15.* For comparisons on what this difference means in required motor sizes, see this chart:

Rated Horsepower (Maximum Hp, TEFC)	Maximum Continuous Hp—*Super-Seal* Motor
15 hp	17.25 hp
25	28.75
40	46
75	86.25
125	143.75
200	230
350	402.5
500	575

Join the swing to *Super-Seal* motors. It will pay dividends fast. Contact your A-C representative or distributor, or write Allis-Chalmers at address shown on back page.

ALLIS-CHALMERS

SOUTHERN CALIFORNIA EDISON LONG ISLAND LIGHTING AVCO UNION BAG UNIVERSAL ATLAS UNION CARBIDE OHIO OIL INTERNATIONAL PAPER SOUTHERN PACIFIC PIPE LINE ALCOA ROHM & HAAS ARMOUR SHELL OIL COMMONWEALTH EDISON OWENS-ILLINOIS WYANDOTTE CHEMICAL BETHLEHEM STEEL ALLEGHENY-LUDLUM DU PONT DETROIT EDISON MEAD SINCLAIR PIPE LINE ESSO HERCULES POWDER GENERAL TIRE MONSANTO

This *SUPER-SEAL* MOTOR application SAVED $3000!

Find out how much you can save

This application of a *Super-Seal* open-type motor — in place of a weather-protected design of the same rating — *saved the user $3000.00!*

You can achieve similar savings! Fill out the data sheet below and *find out for yourself how much you can save — on a "no-strings-attached" basis.*

Here's what to do: 1) Select an enclosed motor application in your operations (a new motor need or, for comparison, a motor just purchased); 2) fill out the data sheet; 3) mail to the address shown.

We'll give you a cost quotation on a *Super-Seal* open motor for that application.

Fill out this data sheet—

no strings attached—to find out how much you can save on a new motor or on an existing motor installation

To: **ALLIS-CHALMERS**
888 S. 70th St., Milwaukee 1, Wis.

Motor Data

1. Type (i.e., squirrel cage):
   Horizontal ☐ Vertical ☐
   Hp..... Rpm.....
2. Phase..... Frequency.....
   Voltage.....
3. (For synchronous only)
   Power factor.....
   Starting torque.....
   Pull-in torque.....
   Pull-out torque.....

Application Data

4. Description of application:

5. Drive: Direct-connected ☐
   V-Belt ☐ Other:.....
   Starting load.....
   Ambient temperature.....

6. Operating conditions:
   Dirty ☐ Clean ☐ Wet ☐ Dry ☐
   Other.....

Information on Existing Motors
(for comparison)

7. Type of insulation
   Type of enclosure
   Time rating.....
   Temperature rise.....
   Bearings:
   Anti-friction ☐ Sleeve ☐

8. Special characteristics or construction:

NAME.....

TITLE.....

COMPANY.....

ADDRESS.....

A-5869

ALLIS-CHALMERS

INDUSTRY NEWS

(Continued from page 52)

Crushed Stone convention schedule

NATIONAL CRUSHED STONE ASSOCIATION has issued a preliminary schedule of events for its 42nd annual convention, to be held January 27-30 at the Americana Hotel, Miami Beach, Fla. The events of Tuesday, January 27, are centered about safety, accounting procedures and labor relations. New officers will be introduced and the NCSA safety awards will be presented to winners.

Concurrent sessions on Wednesday will be devoted to salesmen, and to operating men and equipment manufacturers. Operating problems will also be considered on Thursday, with another session given over to executives—"Federal regulations, percentage depletion, depreciation, taxes and labor relations." The Manufacturers Division luncheon is scheduled for that day also.

Subjects to be considered at the general session on Friday include "Large size aggregate bituminous concrete base construction," "Bituminous concrete placing—operation and control," and "Maintaining harmonious management-labor relationships under present day conditions." Interspersed throughout the four days are several social and special events.

Materials handling is put under cover

MANITOWOC PORTLAND CEMENT CO., Manitowoc, Wis., a subsidiary of Medusa Portland Cement Co., has been engaged in a modernization program designed to put raw material completely under cover from the time it leaves the ship until it is processed. Completion is expected early in 1959 of the improvements which include a 234-ft. reclaim tunnel, a storage building and a 2,000-ton capacity silo. Though not contributing to increased productivity, the modernization is carrying out management's intention to cut down on dust and noise in the plant's operation.

Gets mile-long belt

ASH GROVE LIME AND PORTLAND CEMENT CO., Kansas City, Mo., bought a mile-long conveyor belt from Goodyear Co. The 36-in. wide belt was shipped to the company's plant in Louisville, Neb., in two sections.

END

— at INTERMOUNTAIN CHEMICAL COMPANY

Green River, Wyoming

FOUR YEARS of continuous heavy hauling, without breakdown or repair — or even greasing! That's the record compiled by this Continental conveyor system operating in the mines of the Intermountain Chemical Company, at Green River, Wyoming.

The one mile system consists of three units using 36″ x 5″ Continental U. S. T. Idlers on steel frame, operating at the speed of 300 feet per minute and delivering 350 tons per hour, three shifts per day, five days per week.

If your tough hauling jobs demand economical and dependable operation with low maintenance cost, let Continental engineers work it out for you.

• *Call, wire, or write your nearest Continental office.*

CGC

INDUSTRIAL DIVISION

Continental Gin Company

BIRMINGHAM, ALABAMA

ATLANTA • DALLAS • KNOXVILLE • MEMPHIS • MOBILE • NEW YORK 17

Enter 1236 on Reader Card

Take it from the man in the driver's seat... here are big reasons

why operators recommend ...to increase your daily

"The International Payscraper does not nose over or up in tight spots," states Operator Cecil Dickson, for C. & Z. Construction Co., Memphis, Tenn. The three "75's" in this fleet each get a heaped 22-yard load in 25-32 seconds—with the TD-24 as pusher. The job: building farm-to-market road near Covington, Tenn.

Operating safety is essential on mountain terrain. Ripon Construction Co., working near Weaverville, California, appreciate International "75" Payscraper safety — handling a subcontract on a road in mountainous Trinity County, with three "75's" and two TD-24's for pusher power. Cuts run to 75 feet deep!

Payscrapers production!

This new TD-20 is pusher for a pair of fast-loading "55" Payscrapers—on a street improvement project in Denver. Horn Construction Co. is the contractor.

Riding on the shock-absorbing, deep-padded seat, the International Payscraper® operator soon learns he can cross rough spots—ascend or descend steep pitches, loaded or empty—without neck-snapping, spine-smacking jolting or bouncing. He practically gets automotive riding comfort!

When he needs positive braking, he has powerful, heavy-duty four-wheel air brakes—synchronized on both tractor and scraper wheels—to decelerate and stop surely, even with heap loads on steep grades. And for "walking" the rig through soggy going, he has auxiliary hand-braking of the individual drive wheels!

Guiding a big earthmover is no longer an athletic event—no longer demands "muscle" or tussle! The Payscraper gives him exclusive Hydro-Steer—hydraulic steering powered for smooth, positive one-hand turns! Even the clutch is air-assisted for operating ease and fast, positive action!

And an operator has no fear of "nose-diving" or jack-knifing—not with International Payscraper design! The oscillating hitch assembly and forward pitched spindle prevents these machine contortions! Low center of gravity means extra stability, too, on uneven terrain.

These are big reasons why operators have the confidence to use full Payscraper power and speed—to give you full capacity and cycle-speeding loading, hauling, and return!

"Our three '55' Payscrapers are best for our land clearing and stripping needs in this sandy area—and we compared thoroughly with competitive machines," states Tom Hutchinson, for Hutchinson Bros., Inc., Pompano Beach, Fla. "We like the way the '55's' boil up a full load fast; then get to the fill and back quick."

Get in the driver's seat—get the operator's feel of International Payscraper performance. See for yourself what a big factor complete operating ease and confidence can be in increasing earthmover capacity! See your International Construction Distributor for a demonstration!

International® Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors...Self-Propelled Scrapers and Bottom Dump Wagons...Crawlers and Rubber-Tired Loaders... Off-Highway Haulers...Diesel and Carbureted Engines...Motor Trucks...Farm Tractors and Equipment.

HINTS AND HELPS

Profit-making ideas developed by operating men

This tailings chute follows directions easily

STRUNG UP LIKE WASH ON MONDAY, this tailings chute puts waste water wherever its needed. A midwestern sand producer welded straps to curved steel plates to make this segmental chute. Each plate extends the chute along the guy wire to carry the tailings away from the washing tower, to a drainage pile. It is a simple matter to change the location of the waste pile, either by adding plates, or by pulling one away from the next to start a new pile closer to the tower.

Here's a word of caution: Don't drown in your own pool

THERE HAS BEEN A LOT of attention paid to the dangers of working around the machinery in rock products producers plants. Not too much attention has been paid to the hazards around dredging operations, where even the simplest precautions could pay off. Every dredge and every pond operation should be equipped with life jackets, and every worker encouraged to use them when working alone near the water.

Another inexpensive precaution would be a plentiful supply of life preservers and rope, both placed where they can be used at a moment's notice. The elementary requirement that operators and maintenance men on dredges and pipelines know how to swim is often overlooked, as is the need to have an extra small boat always available on the shore nearest the area where other men are working. In an emergency, these precautions will save time—and lives.

Dust sprays

A CRUSHED STONE PRODUCER rigged up this water spray system in the truck dump hopper right over his primary crusher. It proved to be a most effective method to suppress dust without using a great deal of water. A fine spray seemed to give better results than great volumes of water.

While the system was originally provided to relieve the crusher operator from clouds of blinding dust, it was so successful that far less dust was carried to the adjoining property. The installation of two or three more similar sprays almost completely eliminated objectionable dust.

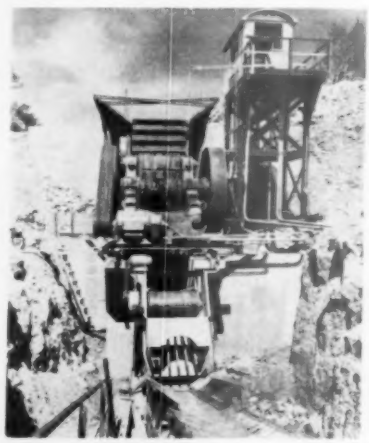
Belts are valuable; extra care pays off

IN SPITE OF THE FACT that modern belts are tougher and more rugged than ever, they are so costly that it pays to carefully design ways of protecting them from premature wear.

One of the critical points of wear occurs at the loading point, where the fast-moving belt picks up its full load of material which is often dropping horizontally. This change in direction can be most destructive unless the belt designer does something about it.

A Wisconsin rock producer solved the problem in this way: A wide, slowly moving belt under his jaw crusher absorbs the impact of sharp rock tumbling from the crusher as it pulls the rock away from the crusher. Slow as it is, there is enough forward movement to eliminate churning and tumbling as the rock hits the faster travelling long conveyor below.

The valuable long belt is protected from the impact of large, sharp rock by an ingenious grid in the transfer chute. The grid scalps off the big stuff, allowing the fines to fall through and



build up on the belt conveyor. Then, as the rock skids across the grid, it drops onto a cushion of fines. A few hundred dollars spent for design and material for this grid will certainly add years to the life of the long belt.

(Continued on page 64)

US RUBBER SEARLE SLEEVES

"U. S." Searle Sleeves help roll up 4,000 tons an hour

To build a causeway, the contractor planned on excavating and placing over a million yards of fill a month by conveyor belt.

Trouble began when mud and sand built up to an almost concrete-hard finish on the return idlers. This accelerated cover wear, caused the belt to wander, also caused excessive belt stress—all of which would result in premature failure. Then a "U. S." Belting Engineer suggested patented U. S. Rubber Searle Sleeves on the return idlers. Over six hundred of these specially designed rubber sleeves were cemented to the 6"-diameter idlers. Build-up of mud and sand ceased and wandering of belt stopped. The sleeves gave fine performance, needed no maintenance, and moved 4,000 tons an hour.

• • •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

US RUBBER

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

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Program Preview

FOUR DAYS FILLED WITH DISCUSSIONS OF INDUSTRY-WIDE PROBLEMS AND SOLUTIONS

42nd ANNUAL CONVENTION NATIONAL CRUSHED STONE ASSOCIATION

TUESDAY

"Safety Progress in the Crushed Stone Industry"
"First International Skid Prevention Conference"
"New NCSA Accounting Manual for the Crushed Stone Industry"
"Startling Implications of Union Political Power"
Greeting Luncheon—Presentation NCSA Safety Contest Awards
Afternoon—"Round Table on the Application of the New NCSA Accounting Manual"
Evening—Open for Individual Plans

WEDNESDAY

Operating session—informative talks on operating problems concurrently with . . .
Session for Salesmen
General Luncheon—"Humor in Your Business"
Afternoon and Evening—Open for Individual Plans

THURSDAY

Simultaneous Informal Group Discussions on Operating Problems concurrently with . . .
Session for Executives—"Federal Regulations, Percentage Depletion, Depreciation, Taxes and Labor Relations"
Luncheon—Manufacturers Division
Afternoon—Open for Individual Plans
Evening—Patio Party—dining, dancing, entertainment

FRIDAY

"Large Size Aggregate Bituminous Concrete Base Construction"
"Bituminous Concrete Placing—Operation and Control"
"Maintaining Harmonious Management—Labor Relationships Under Present Day Conditions"

FOR THE LADIES

Entertainment and special functions for the ever increasing number of ladies attending the convention.

AMERICANA HOTEL, MIAMI BEACH, FLORIDA

January 27, 28, 29, 30, 1959

Yes! . . . it's ALL STEEL

HP RANGE:
½ to 50 hp

RATIOS:
4:1—14:1—24:1 (or 20:1)

OUTPUT SPEED RANGE:
420 to 5 rpm

TORQUE RATINGS:
up to 31,500 lb-in

FALK
ALL STEEL
Shaft Mounted Drive

. . . Steel can "take it"!

STEEL frame . . . of fabricated plate supports all rotating elements—provides double the ability of iron to maintain vital alignment of revolving elements, even under shock load or external impact.

STEEL housing . . . will not fracture, serves only as protective cover and lubricant reservoir. Therefore, lubricant supply is safeguarded.

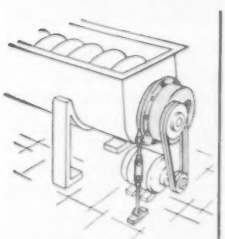
STEEL tie-rod and straddle-mounted tie rod brackets . . . are fastened to heavy steel frame by steel bolts in double shear.

DELIVERIES TO MEET YOUR REQUIREMENTS

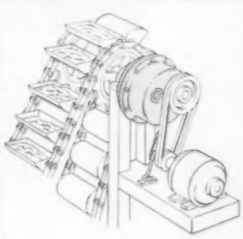
Off-the-shelf delivery from your Authorized Falk Distributor. *Shipment from factory or warehouse stocks* within 72 hours after receipt of your order.

Write for Bulletin 7100

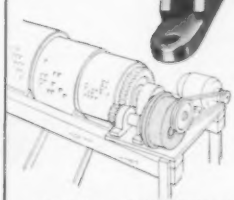
A FEW TYPICAL APPLICATIONS



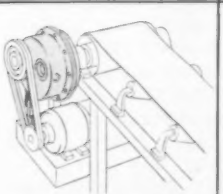
SCREW CONVEYOR



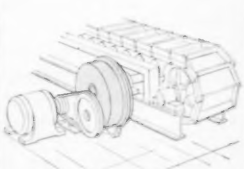
BUCKET ELEVATOR



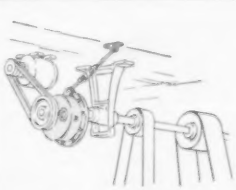
GRAVEL CLASSIFIER



BELT CONVEYOR



APRON FEEDER



LINE SHAFTING

THE FALK CORPORATION, 3001 W. CANAL ST., MILWAUKEE 1, WIS.

Representatives and Distributors in Most Principal Cities

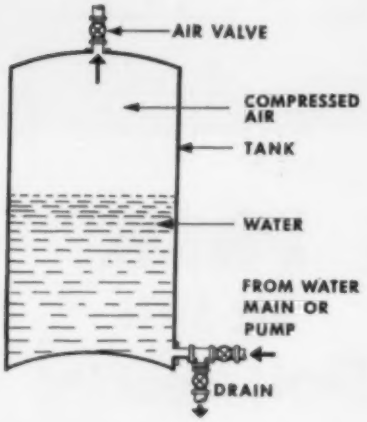
Manufacturers of Quality Gear Drives and Flexible Shaft Couplings

FALK

. . . a good name in industry

HINTS AND HELPS

(Continued from page 60)



How to make an air compressor

EVERY ONCE IN AWHILE there is an emergency need for compressed air, and the usual way is to go helplessly without it because of no air compressor. But in most cases, by exercising a little ingenuity compressed air can be made available. The sketch shows how to convert water pressure into compressed air without the use of a pump or any other equipment aside from a "pressure container." An ordinary water tank is shown, but any other tank can be used provided it won't leak.

Close the "air valve" at the top and allow water to enter at the bottom. When the trapped air attains the same pressure as the water in the main, the inflow of water will cease.

The compressed air can then be used for many purposes, paint spraying, filling truck or automobile tires, dusting, blowing scale out of radiators, or starting diesel engines. When the tank is full of water, drain it and repeat the process.

W. F. Schaphorst, M. E.
Newark, N. J.

Keep clean

VACUUM CLEANERS could be as useful in rock products plants as they are in the homes of those who work in these plants. Some few plants depend on industrial vacuum cleaners to maintain a high level of good housekeeping. Invariably they have found that attention to plant cleanliness has paid off in lower maintenance of equipment due to dust damage, improved product quality and safer, more healthful working conditions.

Here a workman in a western cement company cleans up some dust on the floor of the control room.

Machinery attachments pay off

ATTACHMENTS FOR SINGLE-PURPOSE equipment should not be overlooked as a way to improve the effectiveness of the machine. This eastern rock products producer realized that the cost of a small dozer blade for his tractor shovel paid off handsomely when it was used to keep his haulage roads smooth.

The shovel is regularly used to load trucks with aggregates from stockpiles, but often finds the time to do minor repairs and leveling on roads around the quarry.

Improve screening action

IT IS NOT ALWAYS POSSIBLE to design chutes or conveyors bringing materials to vibrating screens to locate them in just the right position for maximum screening efficiency. If the flow of material does not distribute itself across the full width of the screen cloth, screening efficiency is lowered and the cloth wears out prematurely.

A southern stone producer discovered this in the operation of a screen under a belt conveyor which came to the screen at a sharp angle, throwing the stone to one side of the cloth. The maintenance supervisor easily remedied the difficulties by bolting a light angle about 18 in. long right to the screen cloth. By adjusting the placement of the angle he was able to achieve a uniform distribution of stone across the cloth and to improve the efficiency of the screen.

END

Sand slinger moves material from belt to truck

WHY HANDLE SAND TWICE; once into storage and then reclaim it? That's what this Wisconsin sand producer wondered when he saw his trucks pass this transfer point in his belt conveyor system on the way to the stockpile. A quick, easy answer: Don't. By making the drive on the stacker belt reversible, he now slings sand back down off the tail of the conveyor into a waiting truck. It only takes a few minutes to load even the largest truck. Then the man in the control tower flips a switch, and the belt stops, and changes direction again taking sand to the stockpile.

Exclusive 4-In-1 "concrete-bucking" pry-over-shoe break-out action—breaks up, digs up, and loads out old pavement—gives big advantages over "single-action" rigs! The new TD-15 4-In-1 exerts the tremendous break-out force of 42,650 lbs! You also get 'dozer, "carry-type scraper," and multi-purpose clam-shell actions in all International Drott 4-In-1's!

NEW International® Drott TD-15 Four-in-One

capacity . . . to outload 100 hp "single-action" rigs plus versatility unlimited . . . of exclusive clam-action

Sized, powered, geared, and **controlled** to decisively outproduce any "single-action" loader in the 100-hp field—the new 2¼ cu yd TD-15 4-In-1 gives you exclusive International Drott clamshell action!

Here's new big-job-sized versatility unlimited! Simply move the selector lever with fingertip ease—to get any one of four big-capacity machine actions needed. On big job after big job, the TD-15 4-In-1 can replace costly big-capacity limited-action machines one after another!

And whether this 4-In-1 replaces four or forty machine actions for you, you get it for one moderate price!

Smooth, years-proved, 115 hp 6-cylinder International diesel engine in the new TD-15 4-In-1 gives you full advantage of increased hydraulic system capacity—of new 6-speed, full-reverse transmission mobility – of new cycle-speeding forward-reverse Shuttle-Bar control!

Correct balance and long-track stability eliminate the need for counter-weighting the TD-15 4-In-1. Track length on the ground is a full 98⅜ inches!

Compare capacity and versatility in your own pit, quarry or strip-mine!

There's only one way to size-up TD-15 4-In-1 performance—to measure its job range and capacity—to compare its money-making capabilities to a yard-full of one-purpose rigs. That's to get on the deep-cushioned seat and prove to yourself what it can do. See your International Drott Distributor for a demonstration!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT

YOU'VE GOT A DATE IN NEW ORLEANS

NSGA
NATIONAL SAND AND GRAVEL ASSOCIATION
43rd ANNUAL CONVENTION

NATIONAL READY MIXED
NRMCA
CONCRETE ASSOCIATION
29th ANNUAL CONVENTION

TIME: February 16-19*
PLACE: The Roosevelt Hotel

You owe yourself and wife this trip to famous old New Orleans.

You owe your business this all-important meeting with your associates to discuss the vital problems and important opportunities that face your industry.

What's ahead in building materials markets, in our industry's management-labor relations . . . engineering and research, our laboratory operation . . . progress in the fast developing public relations programs . . . progress in safety and adaptation to new zoning requirements . . . up-to-date information on taxation, freight rates, cost analysis, mobile radio, merchandising . . . these are some of the subjects scheduled for round table and panel discussions.

Make your plans—make your hotel reservations and . . . *be sure to be there!*

*Convention registrations will begin at The Roosevelt Friday morning, February 13.

*Committee meetings start February 13. General sessions open Tuesday, February 17 and continue twice daily through Thursday afternoon.

PRODUCER

The Wemco-Remer Jig:

A Big Difference — Designed Specifically for the Aggregate Field

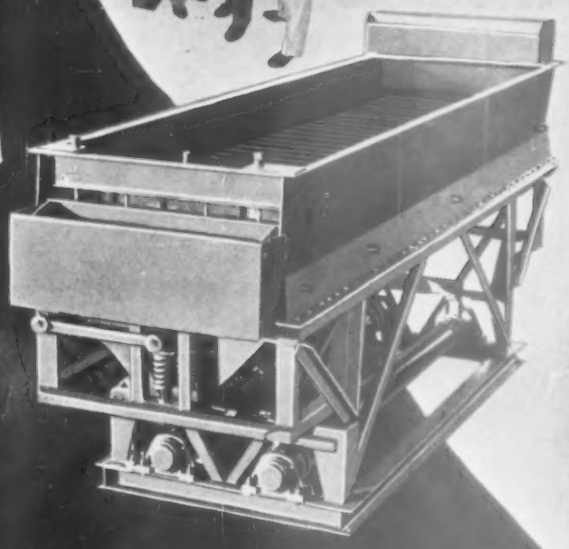
The distinction is in its standout *method* of removing objectionable materials to meet the most rigid specifications.

Many deposits, formerly unusable because of coal, shale and other light weight particles, are today profitably operated with Wemco-Remer Jigs on the job.

The reason: exclusive Wemco-Remer Differential Acceleration — a combination of a conventional jig stroke with a high frequency stroke — and other features developed *by* operators *for* operators — to consistently answer the *extra* tough problems.

Get all the facts on the *big difference* of the Wemco-Remer Jig!

Depend on the Wemco-Remer Jig — and the skills behind it.



WEMCO®

Western Machinery Company
650 Fifth St. • San Francisco, California
and throughout the world

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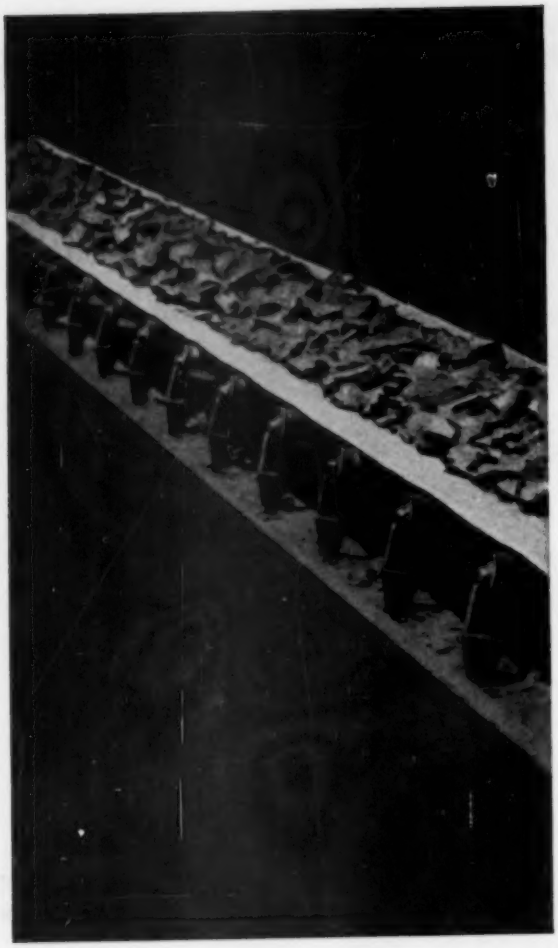

WHY BUY

ONLY 2/3 OF A BELT?

...it's the Last Third of an R/M Conveyor Belt that Gives

"More Use ~~per~~ *for your* Dollar"

It's the *last* one-third of conveyor belt life that determines its final cost. Real conveyor belt cost is the cost per foot of belt in terms of load carrying capacity for the *potential service life of the belt.* R/M's new conveyor belt construction now assures you ⅓ longer belt life! Here's why:

R/M engineers recognize that every belt feature—troughability, resiliency, fastener holding ability, strength member fabric, cover toughness and thickness—help determine the true cost of Ray-Man Conveyor Belt on your job. And that's why every Ray-Man component is precision proportioned to assure better belt balance where it pays off most for you—in longer belt service life!

Let an R/M representative show you how *extra* life in the last ⅓ of conveyor belt service means "More Use per Dollar" with Ray-Man Conveyor Belt and other R/M heavy duty constructions.

RAY-MAN CONVEYOR BELT

- Trains Naturally
- Resists Impact and Ripping
- Double Compensation Relieves Outer-Ply Stress
- Holds Fasteners
- Requires No Breaker Ply
- Exclusive "XDC" Long-Wear Cover
- Moisture Resistant, Mildew-Proof

RMB12

BELTS • HOSE • ROLL COVERINGS • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls

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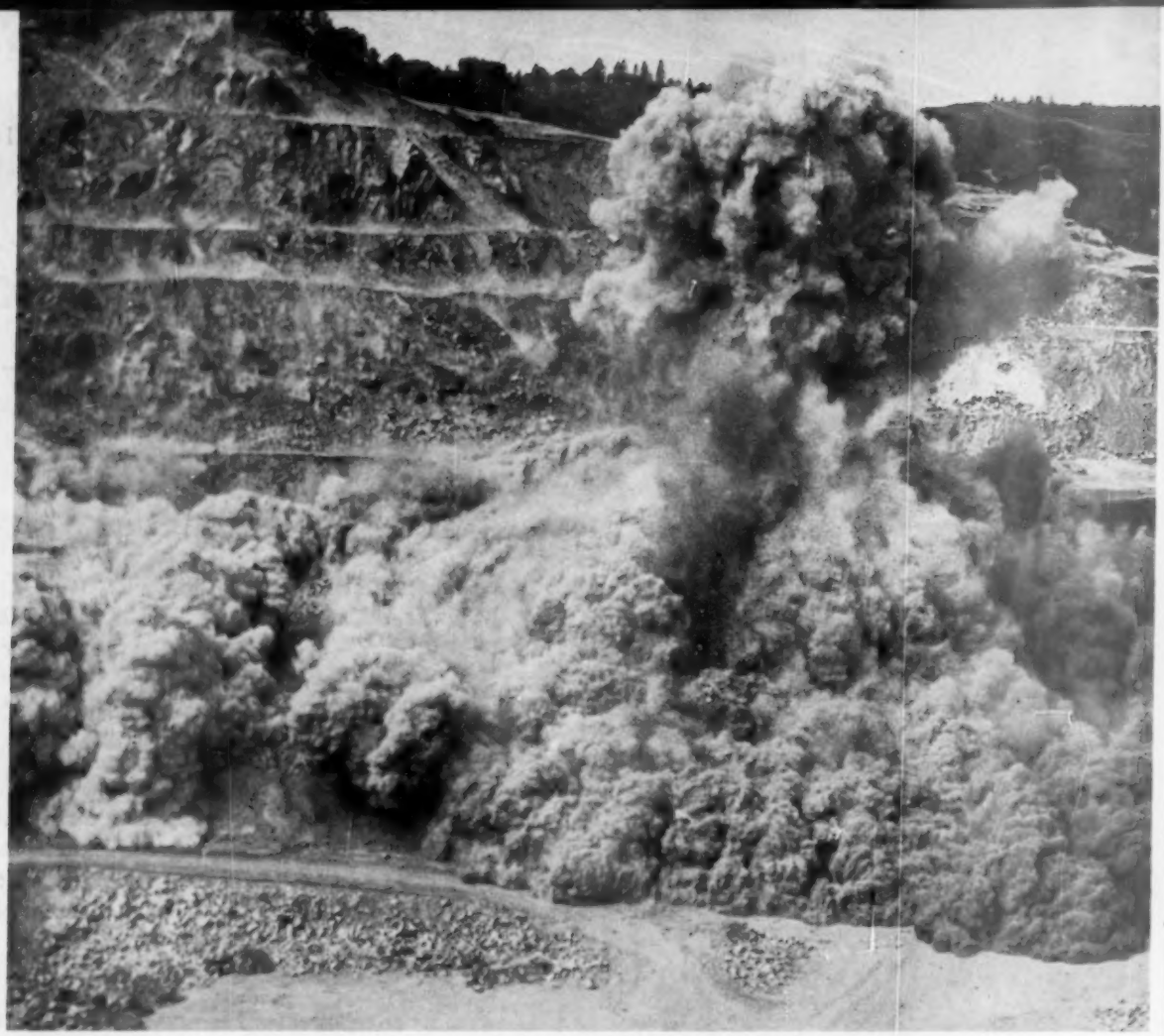


Impressive blast at Calaveras Cement Co.'s quarry showed what the new explosive can do

New blasting technique cuts costs

A recent development in ammonium nitrate promises savings

NOW—YOU CAN USE IN YOUR QUARRY a new type prilled ammonium nitrate explosive that doesn't need a high-type explosive as a primer. The development, announced in September, 1958, with a special demonstration at Calaveras Cement Company's quarry, is said to bring new cost-reduction possibilities to open-cut mining and quarrying. The new material—called N-IV (four) by Spencer Chemical Company, the manufacturer—can be handled as safely as the ammonium nitrates now in common use, according to reports.

Representatives from several phases of the mining industry witnessed the special demonstration at Calaveras. Based on observation alone, the test blast was highly successful. One company official said that it "showed a bigger kick than the regular method (ammonium nitrate) we've been using." Another remarked that the shot "had a real snap to it."

The demonstration shot was set up in two contiguous areas as a semi-comparative shot. In the first area 23 holes were loaded with 23,000 lb. of N-IV, with only ⅜-in. detonating cord as the primer; the other six holes held 5,000 lb. of regular ammonium nitrate prills plus a dynamite primer.

Only oil-treated explosive and detonating cord are needed

by George C. Lindsay

The second area, located near the first but on the next bench up, consisted of 9 holes loaded with a total of 7,000 lb. of N-IV. No high-explosive primer was used in these holes, only a 180-grain detonating fuse. Diameter of all holes was 9½ in. Each was drilled with a vertical rotary drill.

The total shot consisted of 35,000 lb. of explosive, which broke about 35,000 cu. yd. of rock. Ammonium nitrate prills in all holes were treated with 6 percent by weight of No. 2 fuel oil.

Main differences between the new prills demonstrated in this blast and the standard fertilizer grade of ammonium nitrate are: (1) the new material basically is an uncoated material, and (2) a special surface treatment has been applied to the individual particles, or prills.

The special treatment is said to make the prills anti-caking, a condition formerly obtained by adding inert coating materials such as clay. The usual 2-4 percent of inert materials is thus eliminated. In addition, a retarding or "cushioning" effect of the coating is said to be reduced. Mainly, the treatment is said to improve the ability of particles to absorb fuel oil by 50 to 100 percent.

Advantages of the new material, as reported, include:

(1) Elimination of the inert coating materials increases the blast sensitivity of an ammonium-nitrate-fuel oil mixture to the point where it can be detonated by a ⅜-in. detonating cord. This can mean savings. Spencer says that a typical 6½-in. hole loaded with the new N-IV and fuel oil combination costs $5 less to blast than one using standard ammonium nitrate-fuel oil and dynamite.

(2) Less N-IV may be used to do a blasting job than required when normal ammonium nitrate is used. The reason: inert ingredients, usually 2-4

Please turn to page 118

You needn't spend a fortune to advertise successfully

by Joseph N. Bell

THERE ARE LOTS OF ADVERTISING SHORT CUTS—many of them neither well known nor often considered—which can pay dividends to the rock products operator on a very modest advertising budget.

Advertising media of practical value to rock products producers fall into four general categories. Let's examine each of them briefly and see how they can be used in a low-budget advertising program.

1. Maximum Use of Company Property. One advertising medium is available to **every** businessman: his own plant area. Do you use your company property to full advantage in advertising your name and your product? This is the least expensive type of advertising—and often one of the most effective.

Many people drive past your plant site weekly. Is the name of your company clearly, cleanly and professionally lettered on your building, large enough to be seen at a distance? Have you considered a billboard on the busiest corner of your property? Are your products attractively displayed in your office or in areas around the property that visitors will pass?

Do you have a company signature that is easily identifiable? Do you have a group of already-prepared signs that you can leave on job sites—or wherever else the opportunity arises—to identify you with the job? Do all the employes of your company who are likely to come into contact with the public have calling cards which they can scatter judiciously among prospective customers—no matter how far removed they may seem to be?

All of these things appear so basic as almost to preclude discussion. Yet, surprisingly few companies exploit these homegrown possibilities to the fullest. If you do—and you should—be sure you do them well. For example, you should hire a professional painter to do your lettering—clean, well-designed, and large enough to read. The expense will be almost infinitesimal in relation to the benefits possible.

2. Civic Organizations and Activities. No matter how far afield a company may distribute its products, it is still—in the minds of its neighbors—a local operation. As such, it can advertise effectively through the medium of a number of local civic organizations and activities.

These will vary in every town, but some possibilities are present almost everywhere. For example, it's always good business to tie in with a local success story. When the high school basketball team wins a regional or a state championship, you should be ready to offer trucks to haul celebrants or find some other means of identifying yourself with the civic pride of the day. Your company name, associated with civic success, is a positive advertisement for your products.

You might also consider sponsoring Little League or bowling teams—or similar extra-curricular endeavors. One substantial customer brought in as the result of such activities would more than compensate for the nominal cost involved. You should also be on friendly terms with your local Chamber of Commerce and see that it is supplied with factual, up-to-date information on your company and its operations.

Any work on behalf of local charities or civic organizations—or with schools in the community—will advertise you and your company as public-spirited and public-minded citizens, in addition to giving you personal satisfaction. Those efforts are sure to reflect considerable credit on your company.

3. Direct Mail. This is surely the most selective of all forms of advertising; when you use direct mail, you are assured of delivery of your message. Other than personal calls, direct mail advertising seems to be the best way of reaching contractors and other major rock industry customers. But, of course, getting the piece in the hands of the prospective customer is only one part of the job. To be useful, it must be read—and then must sell your product or your company as a result of the reading.

What are some of the more effective types of mailing pieces?

One of the best would appear to be service bulletins—that is, mailers which give the recipient solid, constructive information. For example, several cement companies mail out tips on the proper handling of concrete for a multitude of uses. These suggestions can mean out-of-pocket savings as well as better results for the customers who receive them. Such bulletins need not be elaborate; the effectiveness of the content is what counts.

Catchy sign on truck of Chuck Tresch & Sons Sand and Gravel Co., Ingleside, Ill., helps bring in sales

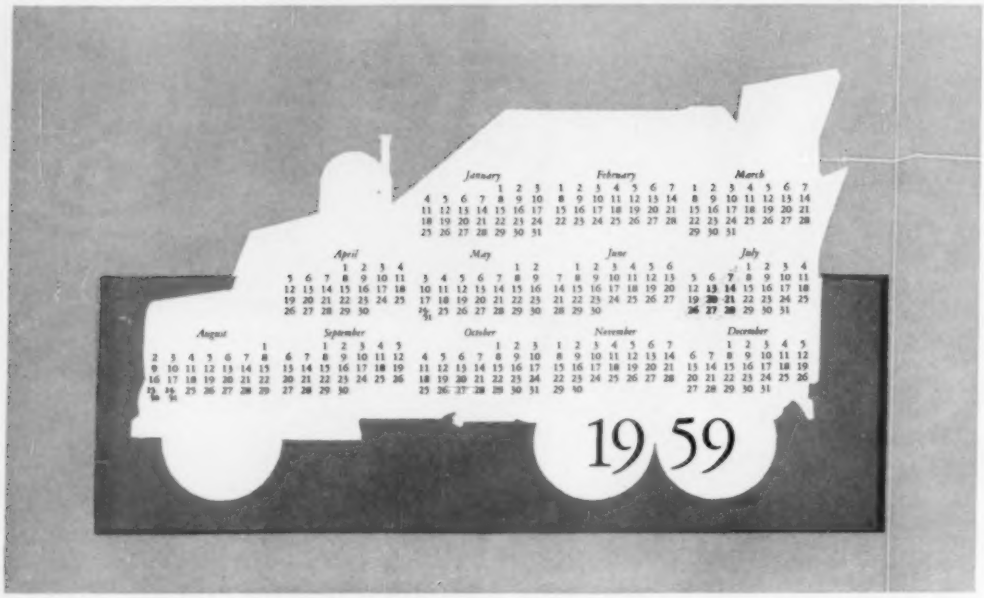
Solid technical information is available to the rock products producer from a number of sources. Use of this information in a series of inexpensive service mailing pieces will virtually guarantee readership, and can also build good customer relations and sales.

Here are some other mailing pieces that—imaginatively done—can stimulate interest in your company and its products:

—Calendars: A wide variety, ranging from desk size to billfold size, are available, imprinted with your name, and at relatively low cost.

—Blotters: Always useful, they can provide an inexpensive mailing piece, especially when individualized in some ingenious way—for example, by mounting a clipping about the recipient, taken from the local newspaper, on the blotter as an excuse for sending it to him.

Mailers, next to direct contact, are best sales tool



Useful calendar mailing piece keeps name of sender before potential customer all year long

Low cost ads *continued . . .*

—**Christmas cards and gifts:** Business Christmas cards, done in good taste, can be a highly effective mailing piece. Unless they are done imaginatively, however, they are likely to get lost in the shuffle. Christmas gifts to customers are a matter of individual preference. Again, it's important that they be in good taste; a case of liquor sent to a customer who doesn't drink can hurt more than it helps.

—**Association and industrial stuffers:** Frequently, trade associations and equipment manufacturers will make available, at little or no cost, mailing pieces on a variety of subjects. These should be carefully screened for (1) suitability and (2) effectiveness. Those that offer both can make worthwhile mailers for your company.

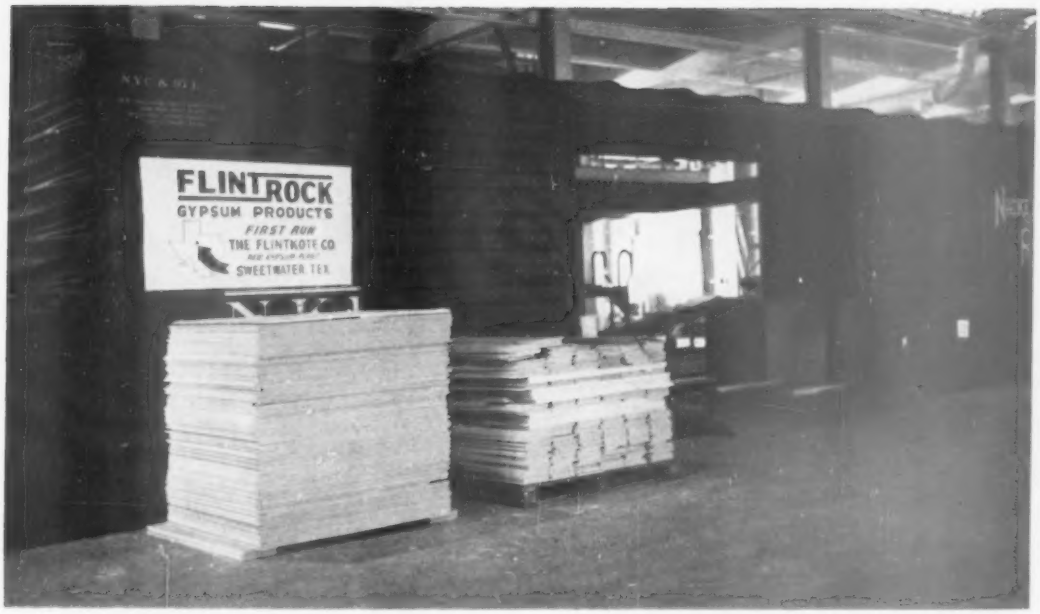
In addition to these more formalized types of direct mail pieces, you are engaged daily in an indirect mail campaign through the medium of business and personal correspondence and billing. You can do yourself a great deal of good—also a great deal of harm—with these everyday messages. Company stationery and statements, for example, should be carefully thought out and converted into a useful sales promotion tool. And company letters should be simple, direct, warm and businesslike—and should reflect the picture of your company which you want to project.

One other warning: direct mail is useless with an archaic mailing list. It should be carefully checked at least once a year.

4. Paid Time and Space. Finally, we come to the type of advertising where consideration too often both begins and ends—paid time and space on local radio or television stations or in local publications. In considering such mass media, one question is paramount: will it economically reach your prospective customers?

Because rock products operators deal with a rather restricted clientele, the shotgun approach in general media like newspapers, radio and television may be wasteful. The exceptions to this generalization might include a type of program or advertisement specifically beamed at rock products customers. For example, an early morning weather report might be **must** listening for contractors—and therefore an economical way of reaching them with a rock operator's sales message. So before you dismiss the mass media, consider whether or not this might be specifically aimed at your customers. If you embark on such a program, it should be concentrated during the building season when your message can take root and bear fruit.

Then, too, you shouldn't dismiss your telephone book listing lightly. This is a point of positive con-



Flintkote's gypsum plant in Sweetwater, Tex., uses attractive sign on freight car. It serves as low-cost traveling billboard

tact with in-the-market prospects. Your listing should stand out as much as possible when a potential customer seeks a number to call. And you should be listed in the yellow pages under as many headings as appropriate.

There are many time and cost-savers available to enable individual rock producers to take advantage of advertising opportunities. All sorts of mechanical aids can be obtained, without charge, in the preparation of advertising—even though your account isn't large enough to attract an advertising agency on the usual 15 percent basis. The advertising department at your local newspaper or radio and TV station has specialists whose free services are available to help you in the production of advertising material. Stock illustrations and headline display type can be purchased at very low cost from art services. And local, regional and national trade associations often have advertising aids available without charge.

It costs you nothing to explore these advertising avenues—and you may turn up ideas of great benefit to you and your business.

The growth of advertising since World War II has been downright remarkable. Advertising expenditures in the United States in 1945 were $2.9 billion; this year they will reach an estimated $10 billion. During the same period, the advertising volume per capita has climbed from $15 to more than $60. Although the bandwagon appeal isn't necessarily a guarantee that paid advertising is just the panacea needed for an ailing rock products operation, still it does indicate that an expanded advertising program at least deserves some extra consideration.

Eldridge Peterson of **Dun's Review** points out that advertising performs four principal functions —and performs them well:

1. Builds a brand name that will create consumer acceptance, perhaps even stimulate consumer demand;

2. Introduces new products, new improvements and new ideas almost overnight to the public;

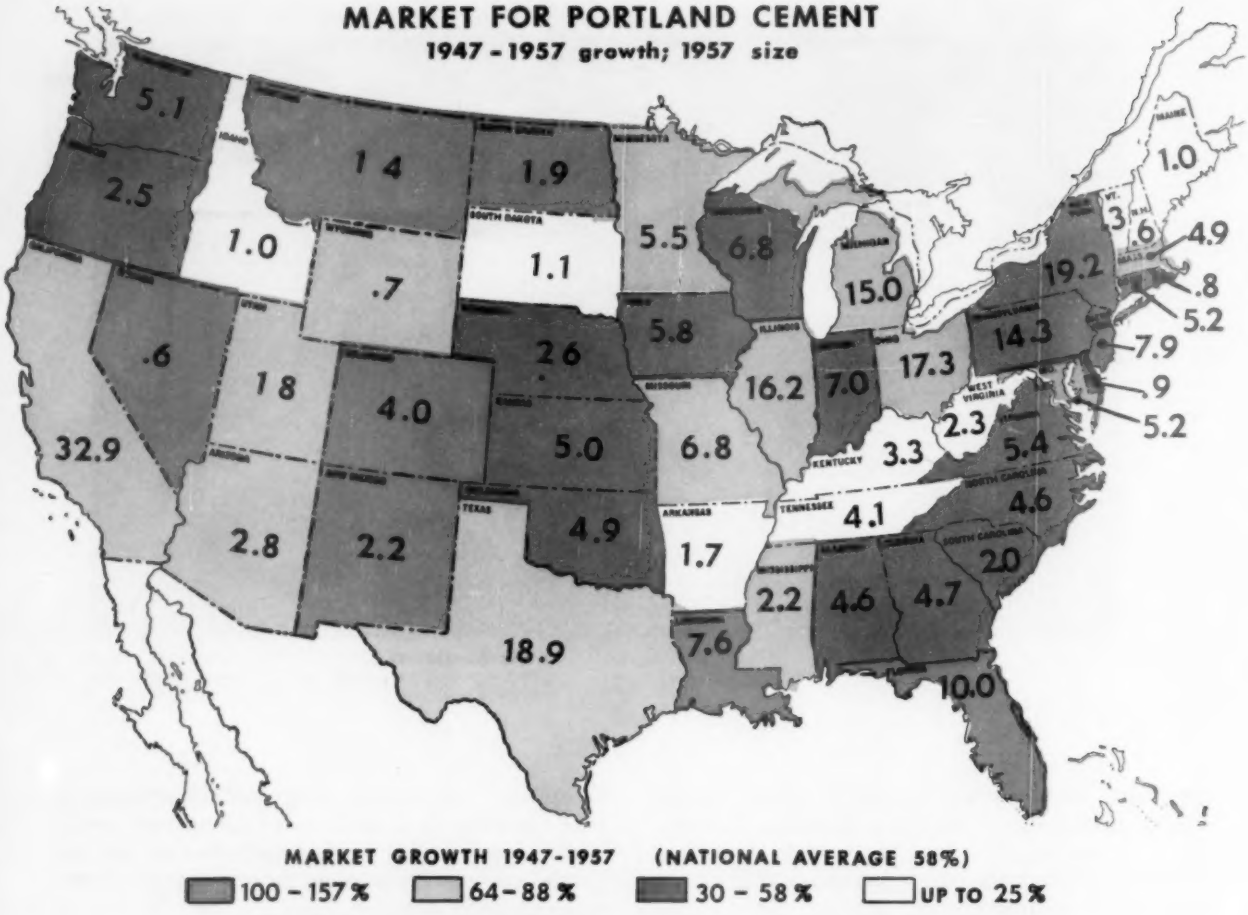
3. Creates an image of your company valuable in attracting good personnel as well as creating good public relations;

4. Obtains distribution for new products and widens distribution for older items.

At the same time, Mr. Peterson points out that advertising cannot produce miracles by enabling you to buck a basic consumer trend, and cannot put over an inferior product no matter how much money you spend.

But the positive benefits of advertising can be considerable if the program is undertaken intelligently and within economic reason. Why not take another look at your promotion program and see if you're selling advertising short? It may pay big dividends—on a surprisingly small investment.

END



Cement industry has built-in

Underwriter sees growing markets, higher

WHEN AN UNDERWRITER* LOOKS AT CEMENT manufacturing, he sees an industry with a built-in future. Demand for cement has been increasing rapidly since World War II and should grow at a high rate in the future. Here are some of the reasons:

—**The substantial increase in population** that is expected over the next decade. This is particularly important because the largest proportional increase is expected to occur in the metropolitan areas (including close-in suburbs) of the United States. It has long been observed that a city of 200,000 population uses a lot more cement than do 10 cities of 20,000. A large group of people living in close proximity has greater per capita need for the type of products—culverts, sewer pipes, highways, sidewalks and other concrete products —of which cement is a major raw material.

—**The Federal highway construction program.** The Bureau of Public Roads, U. S. Department of Commerce, estimates consumption by this program, once it is in full swing, at more than 100 million bbl. annually, at least through 1969. At

**This article is based on a cement industry report published by Blyth & Co., underwriters and distributors of securities. The analysis gives statistics for 29 cement firms with publicly held securities. Written by John R. Beckett, William K. Bowes and Ross J. Cadenasso, copies of the report may be had by writing Blyth & Co., Russ Building, San Francisco 4, Calif.*

Prestressed concrete, as in these beams, is big new market

future

prices for basic industry

such a level, this market alone would use more than 25 percent of the estimated 1958 year-end cement capacity.

—**An increasing volume of public works** such as dams and waterways for conservation and water control and airport enlargement for the accommodation of new jet airliners.

—**The increasing use of new applications** such as precast girders, wall panels, roof slabs and beams and prestressed thin-shell roofs.

Excess capacity. Although the long-range outlook for the cement industry seems to be excellent, there probably will be excess capacity for several years. It will take that long for demand to catch up with the sizable additions to productive facilities brought into production in 1957 and scheduled for completion in 1958-59.

Capacity increased about four percent in 1957 and will increase another eight percent in 1958. By the end of 1958 it will be about 385 million bbl., compared with shipments of about 290 million bbl. in 1957. Year-end capacity in 1957 exceeded shipments during the year by 23 percent.

The cement industry has rarely operated at capacity for an extended period of time. Productive facilities can be expanded only in relatively large stages; plans must be laid months, indeed years, before the new production actually comes "on stream". Thus, it is quite possible for capacity temporarily to exceed demand by a wide margin on either a regional or national basis.

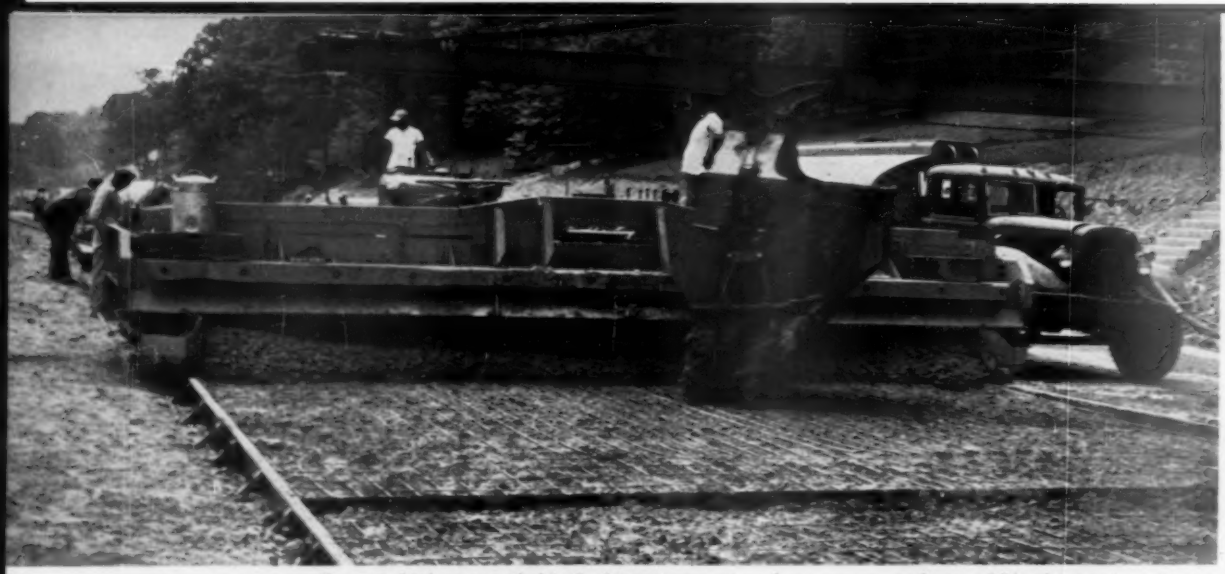
Profits up sharply. Most U. S. cement makers have enjoyed increasing sales and profits since World War II. The great activity in residential, commercial and industrial construction, as well as construction of highways, dams, harbors and airports, has created a large and continuing demand. Besides, cement has become increasingly accepted in newer uses such as precast structural members —girders, slabs, highway bridges—and prefabricated and prestressed structures for use in many phases of commercial and industrial construction.

This combination of increasing activity in cement's traditional markets and the development of new, large-volume applications has resulted in a virtually uninterrupted uptrend in shipments. Shipments increased 71 percent between 1946 and 1957.

During this same period cement prices also rose steadily, the average realized price per barrel increasing about 85 percent. Capacity increased less rapidly, but nevertheless had risen about 50 percent between December 31, 1946, and December 31, 1957.

In the cement business, fixed costs are high and variable costs are low. So the combination of increased shipments and rising prices has resulted in striking gains in profits during the post-war period. In addition, the investing public has capitalized cement earnings at increased ratios in recent years. The result has been great appreciation in cement stocks. The buyer of a package consisting of $100 worth of stock of each of the six leading public companies in 1946 (taking the average of the high and low price in that year) would have seen his $600 investment grow to more than $3,600 at the present time—a whopping 500 percent appreciation!

Right now, cement company earnings may be increased automatically by the newly liberalized



Concrete highways, probably the biggest cement market, consume perhaps a fifth of cement production.

Cement industry analysis *continued . . .*

depletion allowance. In October, 1957, when the Supreme Court refused to review a lower court ruling in the Dragon Cement Co. case, the industry won its fight to compute percentage depletion for income tax purposes on the basis of the mill price of finished cement instead of on the value of the limestone at the time it enters the kiln.

For companies that used the new method in determining their 1957 income tax liability, reported earnings were 15-25 percent greater than they would have been on the old basis. In addition, income tax refunds for the years 1951-56, which in typical cases approximate 1957 earnings, are due the companies.

Must borrow to expand. The price of cement will probably show a substantial increase over the next decade. If demand increases in this period as expected, considerable new capacity will have to be constructed. To make such construction feasible, the financial return must be attractive. The present price of cement does not allow for a particularly enticing return on investment in a new cement plant. A simple example will illustrate this:

—To build a new cement facility now costs $8-12 per bbl. of annual capacity.

—Such a facility can be expected to earn in the neighborhood of 60 cents per bbl. of its total annual capacity.

—So the initial return on such an investment will range from 5 percent to 7½ percent. This is not an especially attractive return, and more productive investments might be made with such funds.

It would seem that the need for new plants will exert upward pressure on the price of cement over the next 10 years. Such price increases would boost cement company profits more than expansion of facilities alone. Price hikes would also help companies that do not have plans for increased facilities.

It appears that future expansion of the industry will be financed in greater measure by long-term debt than was the case in the first post-war decade. Past expansion has been financed largely from retained earnings and cash flow from depreciation and depletion sources. The experience of the 1930s made many cement company executives reluctant to finance expansion by incurring long-term debt in any sizable amounts. But sharply rising expenditures for plant construction the last several years have increased the use of debt financing.

The low rate of return on new cement facilities, moreover, may make it almost mandatory to finance expansion partially with borrowed money. Otherwise, cement companies will not reap adequate returns for their stockholders on the capital so invested. For example, a company investing in a new plant which would obtain a return of 8 percent on its investment if this investment were solely equity can increase the return on equity to about 13.5 percent through borrowing 50 percent of the cost of the new plant.

The debt ratio of most cement companies is still conservative, particularly when compared with the market value of underlying equity. The probable increase in the use of debt over the next 10 years, if kept on a sound basis, will be of benefit to stockholders through increased return on investment and greater earnings per share than would result if such debt were not incurred.

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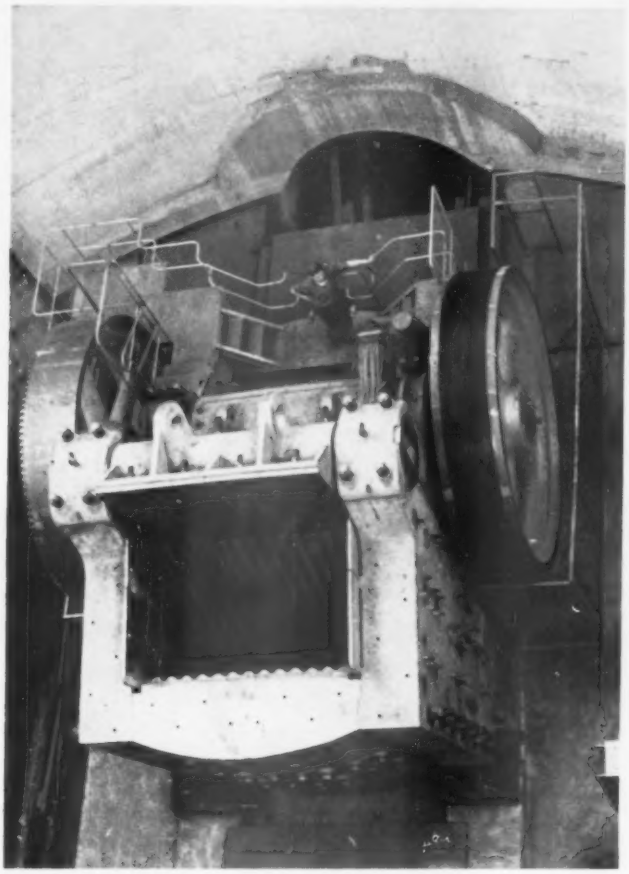
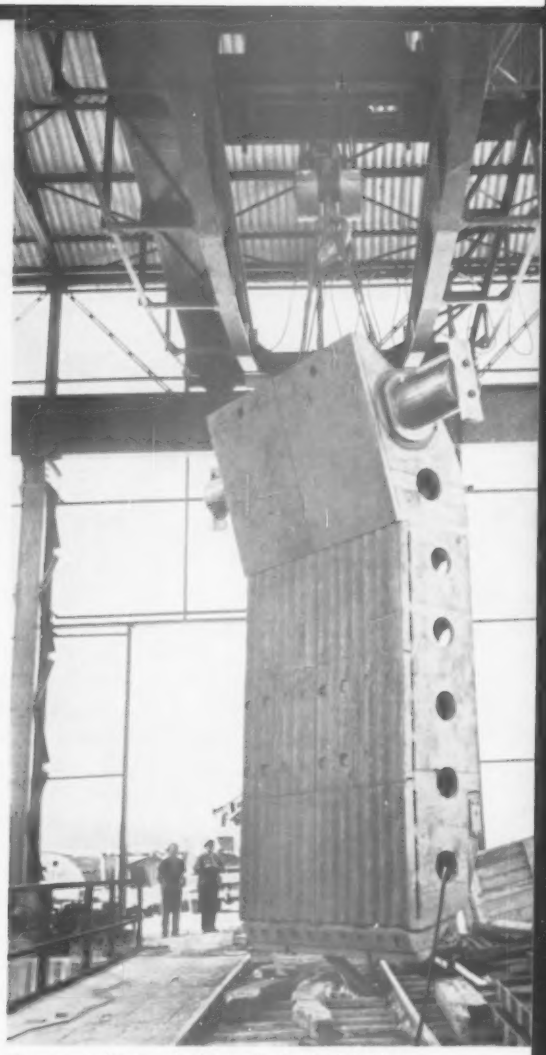


Overall view shows crusher mounted and ready to work



Huge swinging jaw is shown during installation

Is this jaw crusher the world's largest?

by Leo Walter

THE MAKER OF THE "DRAGON" JAW CRUSHER, Appareils Dragon S.A. of Fontaine (Isere), France, claims that it has made the largest unit in use in the world today. The crusher has an effective opening of 8 ft. 3 in. x 5 ft. 3 in.—over 43 sq. ft.—and is in use in the Merlebach quarry of Houilleres du Bassin de Lorraine.

The crusher is fed with stone blocks weighing up to 10 tons and by shovels of up to 6-cu. yd. capacity. When receiving run-of-quarry rock, it has an output of 600 to 800 tph. with a 12 in. setting. Smaller pieces up to 12 in. are in this case routed around the crusher. A quarry capacity of 1,200 to 2,500 tph. can thus be served by a single crusher.

Up to now, the largest crusher in the world was a U. S.-made unit with an opening of 7 x 5½ ft. When Houilleres du Bassin de Lorraine decided to re-equip its quarry to centralize and increase production, its technicians studied crushing methods in several countries. The company's final specifications for the giant-sized machine drew offers from twelve manufacturers in France, Germany and the United States.

The unit is of the Blake double-toggle standard type. Its cast steel frame is made up of six box-section elements rigidly assembled together. The front part of the frame supports the lining plates and works as a fixed jaw. These 12 to 14 percent manganese austenitic steel lining plates are made

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Flocculation—
chemical solution to your slime settling problems

by Walter B. Lenhart

Chemical feeding can be done with very simple devices

FLOCCULATION IS THE HIGH-SOUNDING TERM for a process that can have down-to-earth results for sand, gravel and crushed stone producers with slime trouble in settling ponds and recirculating water systems. At one sand plant, muddy water is cleared by the addition of as little as 20 cents' worth per day of a chemical coagulant—and only a fraction of the former settling area is needed to do the job.

Muddiness is caused by the presence of micron and sub-micron sizes that normally will not settle out in a tailing pond or thickener, or do so very slowly. These particles are kept apart or "dispersed" by forces in the pulp or within the particles themselves.

Here's where flocculation comes in. Certain chemicals will neutralize the forces that keep the small units apart. These chemicals, called flocculating agents, cause the particles to cling together in "flocs" that settle rapidly, leaving the water clear.

Purging often necessary. In a plant where all or part of the muddy water is re-used, a load of the finest sub-micron sizes is built up. Some kaolin clays are especially bad in this respect; montmorillonite clays are usually the worst offenders. Both build up a heavy circulating load of fine slimes which may actually change the density of the water and carry off valuable fine solids. In a case like this, it may be a good idea to purge the entire circuit and get rid of the load before using any flocculating agent.

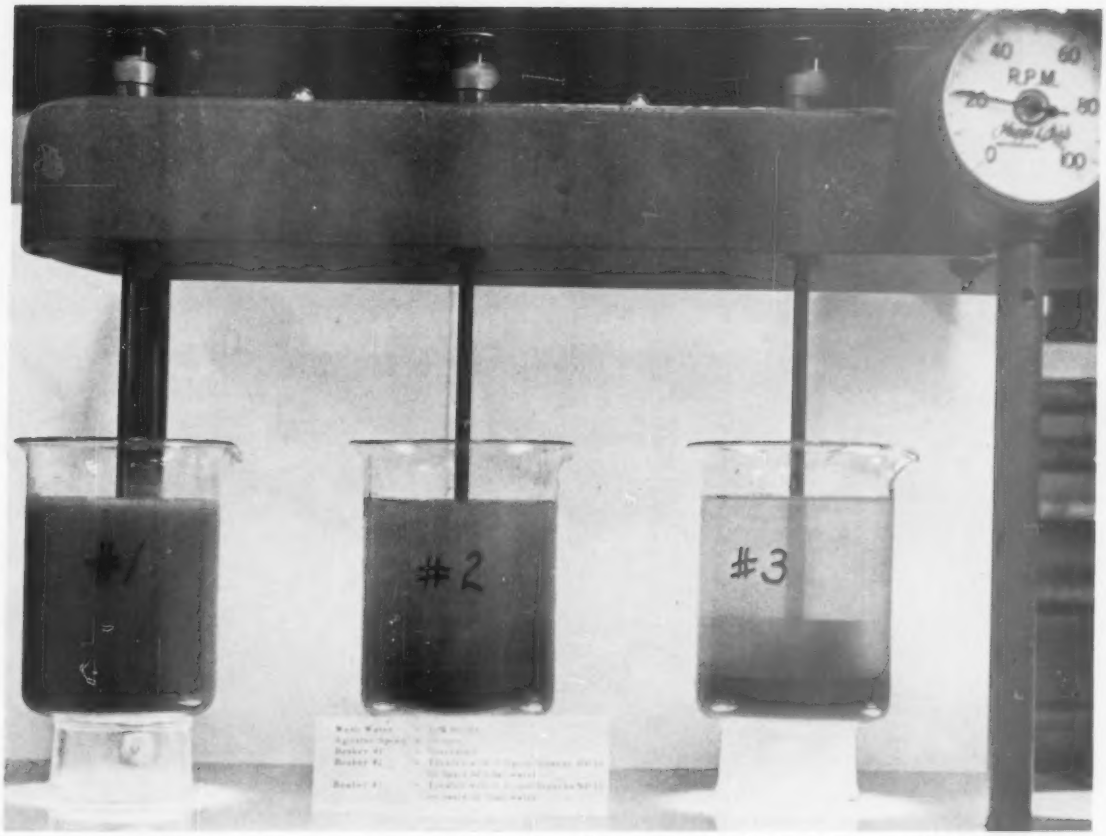
By "purging," we mean to dump the material into a separate pond and forget about it. If this is not practical, an excessive amount of the flocculating material can be added; for the amount of the chemical required is often a function of the amount of true slimes in the pulp. The amount needed to purge the circuit may be so large that it would be uneconomical if continued. If this type of purging is done in a piece of moving equipment, like a thickener, be careful that the rakes are not overloaded from the heavy surge of precipitated material.

Feeding the chemicals. The chemicals are usually dry powders soluble in water. Means should be available to mix 50 gal. or more of a "stock" solution. A clean oil drum with a small electric drill into which a small propellor and shaft can be inserted will serve the purpose.

"Stage feeding" may be necessary; that is, the chemical may be fed into the pulp stream at different places—for instance, at the head of a launder, again at the mid-point and finally (if required) near the end.

With a suitable pump or with an adequate head, the dilute flocculating agent can be added in steps in a pipeline carrying the slimes. Gentle mixing is recommended to avoid breaking down the flocs once they form. Excessive amounts of sand in the slimes may tend to destroy the flocs if too violent agitation is used.

Several kinds of liquid feeders are available, but at the outset a simple drip feeder—a barrel with a petcock—will do. Denver Equipment Co., American Cyanamid Co. and others have or can recommend more reliable and accurate feeders if desired.



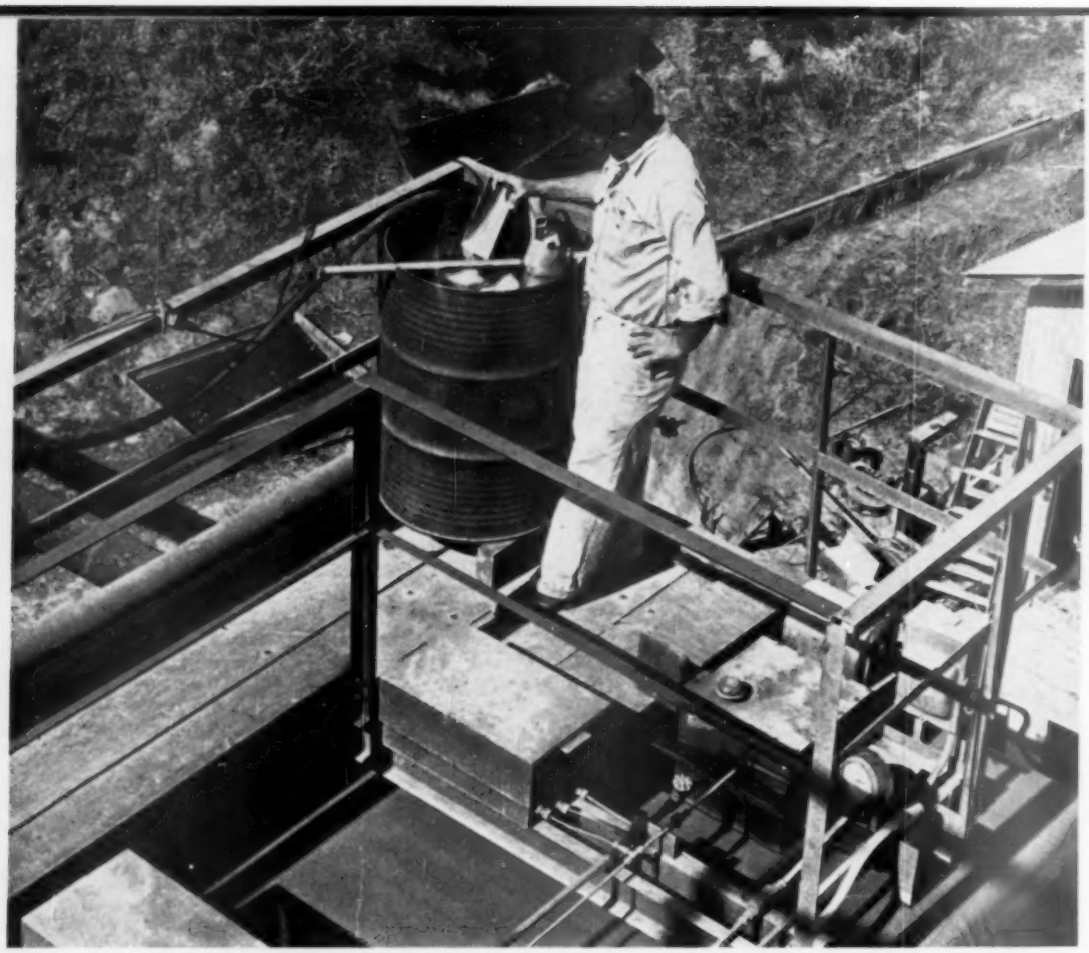
Even with some agitation, flocculating agent does a job. Suspension #1 is untreated, #2 has .6 ppm. agent, #3 has 1.2 ppm.

Lime or milk-of-lime is probably the oldest flocculating agent, and it is usually the first chemical to be tried in plants with muddy water overflowing from the tailing pond. The action of lime is a chemical one, increasing the relative alkalinity or "pH" of the pulp stream. This tends to destroy the forces that keep the grains apart in many types of suspensions.

The pH of pure, or neutral, water is 7.0. A solution with a smaller pH is more acid; one with a larger pH, more alkaline. However, true acids and true alkalis are not always needed to change the pH of a solution. Certain so-called chemicals or salts will do the trick—calcium chloride, ferric sulphate and alum are a few, and others are often highly successful for certain applications. Here's how you can go about finding out which one will solve your problem:

In selecting the proper flocculating agent, the first step is to buy two 1,000-cc. glass graduates. Fill each one with a sample of the pulp to be settled. Let one column remain untreated, and to the other one apply Edison's technique for making a discovery, "cut and try." Since lime is "old reliable," add a pinch of it to this second column. Place the hand over the top of the cylinder and agitate violently for a few seconds; remember that the chemical must be thoroughly mixed with the pulp, but once the flocs form they are delicate, and too much agitation may destroy them. Now compare the settling rate of the lime-treated pulp with that of the untreated pulp.

Next try calcium chloride. For comparison purposes, vary the amount of each chemical used. If the pulp does not show 100 cc. or more of clear water above the muddy-line after 30 min. of settling, try again. Common table salt, aluminum sulphate and portland cement are all relatively cheap and are usually readily available; combinations of these may do the trick. Try making the pulp slightly acid and go through the same routine; ditto for the alkaline side. Once a combination is found that gives a high percentage of clear water in the treated column after 30 min., the work should be repeated on a quantitative basis—



Solution here is being made by measuring chemical, using agitator

Flocculation *continued . . .*

i.e., weigh or measure accurately the amount of each chemical used so that practical calculations can be made.

The above agents are being replaced to a large extent by less bulky and often cheaper chemicals. American Cyanamid and Dow Chemical Co. are probably the two most active manufacturers. Whatever the type or name of the flocculating agent used, it must not contaminate the water and make it unfit for domestic use.

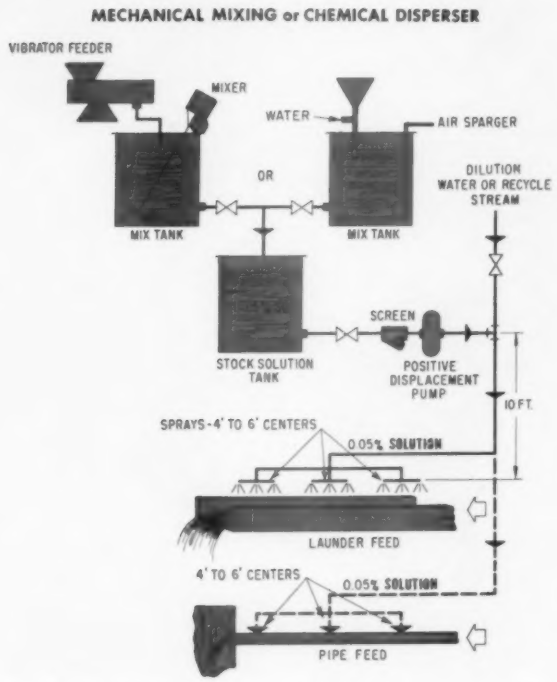
In extreme cases it may be necessary to change the pH to either the acid side or the alkaline. In one application of flocculation technique, the dredge pond was so muddy that the water could not be used on the dredge for washing purposes. A large-diameter pump was installed and some of the muddy water was pumped to the treating section, where it was made acid with a small amount of sulfuric acid. Then as the pulp flowed along in a canal, it was made slightly alkaline with lime. This dual treatment did the trick—the pulp was returned to a pond and the overflow was sent back to the dredge area. But no one treatment did the job.

Relatively simple methods have been developed to determine the pH of a given solvent or pulp; one system uses papers similar to litmus paper, another employs colorometric standard comparisons and a third involves electrical conductivity. But if a problem involves pH changes, it is better to call in a chemical engineer. Very often the manufacturer of flocculating agents will send a competent chemist to do the job.

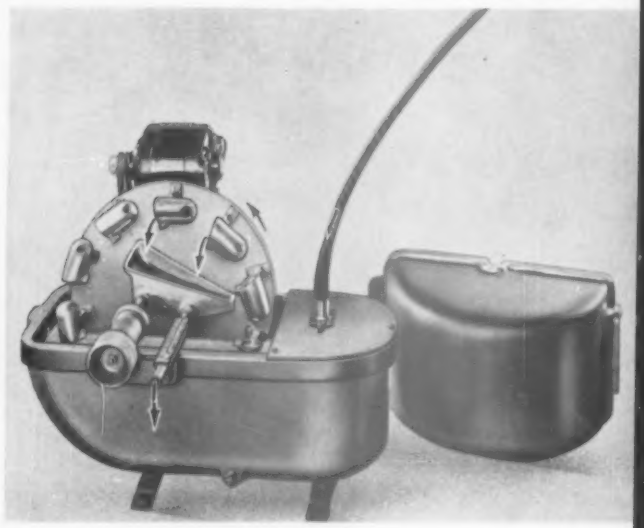
Fortunately, most of the slimes in the rock products industries have a pH close to 7.0, and the cheaper chemical coagulants function properly in the 6.0 to 8.5 range. Many of the chemicals function at amazing speeds.

Here are some of the coagulating chemicals that are available:

The Aerofloc reagents, products of American Cyanamid, are synthetic polymers. These reagents consist of large, complex molecules. When added to aqueous suspensions, they tend to bond together individual fine, solid particles. Where suspended solids are removed by filtration, the re-



Refined system insures efficient use of chemical



Feeder means precise chemical flow control

agents have improved filtration rates up to 150 percent on various types of material.

The Aerofloc are flaky, dry solids that can be dissolved in water. Best results in flocculating suspensions are usually obtained when dilute solutions (½ to 1 percent strength) are fed to the suspension.

To make a solution for feeding purposes, the dry reagent should be added slowly to the water, rather than vice versa, with vigorous stirring. The use of warm water is helpful but not necessary.

The reagent solution is added to the slurry or suspension to be flocculated just prior to a settling or filtration operation. The action of the reagents is practically instantaneous. Generally all that is required is a brief period of mixing to disperse the Aerofloc thoroughly throughout the suspension.

There have been some indications in plant practice that addition of the solution in stages may reduce reagent consumption through more efficient utilization of flocculant. Such reagent economy may not show up in laboratory. Stage addition can best be investigated in the plant, where, for example, the suspension can be fed simultaneously at several different points.

The amount of Aerofloc required is in the area of 1/100 lb. per ton of dry solids in suspension. In very dilute suspensions, .1 to 4.0 parts of Aerofloc per million parts of suspension will usually suffice.

Two Aerofloc reagents are currently available, Aerofloc 550 and Aerofloc 3000. Very often these materials can be used interchangeably. However, in some cases one may be more effective or cheaper to use than the other. In the initial evaluation of the reagents, both of them should be examined.

Aerofloc 550 reagent has found widespread application throughout the mining industry for the flocculation of tailings prior to settling. It has also found use in settling slimes in dredge ponds and is generally applicable in near-neutral or alkaline suspensions.

Aerofloc 3000 reagent is a newer member of the series. It has been found applicable for use in acid circuits as well as neutral and alkaline.

Armour Chemical Division, Armour and Co., has found that several of its Duomacs and Arquads are capable of coagulating and flocculating successfully. Arquads 2HT and S2C have been the most satisfactory; Duomac T indicates that it also has possibilities.

The company has tested Arquad 2HT (1) as a substitute for alum as a pre-flocculant to be used in conjunction with high-molecular-weight polymeric flocculants such as Dow Chemical's NP-10, American Cyanamid's Aerofloc 3000 and Monsanto's Lytron X-886 and (2) as a substitute for alum and the above flocculants. At the present time, tests have been run on a synthetic turbid water in which the dispersed material was a bentonite clay with a soluble lignin color, and on a natural surface water from North Carolina. These tests were made in the laboratory, not in the field. Test conditions were to disperse the bentonite in tap water and then under rapid agitation to add

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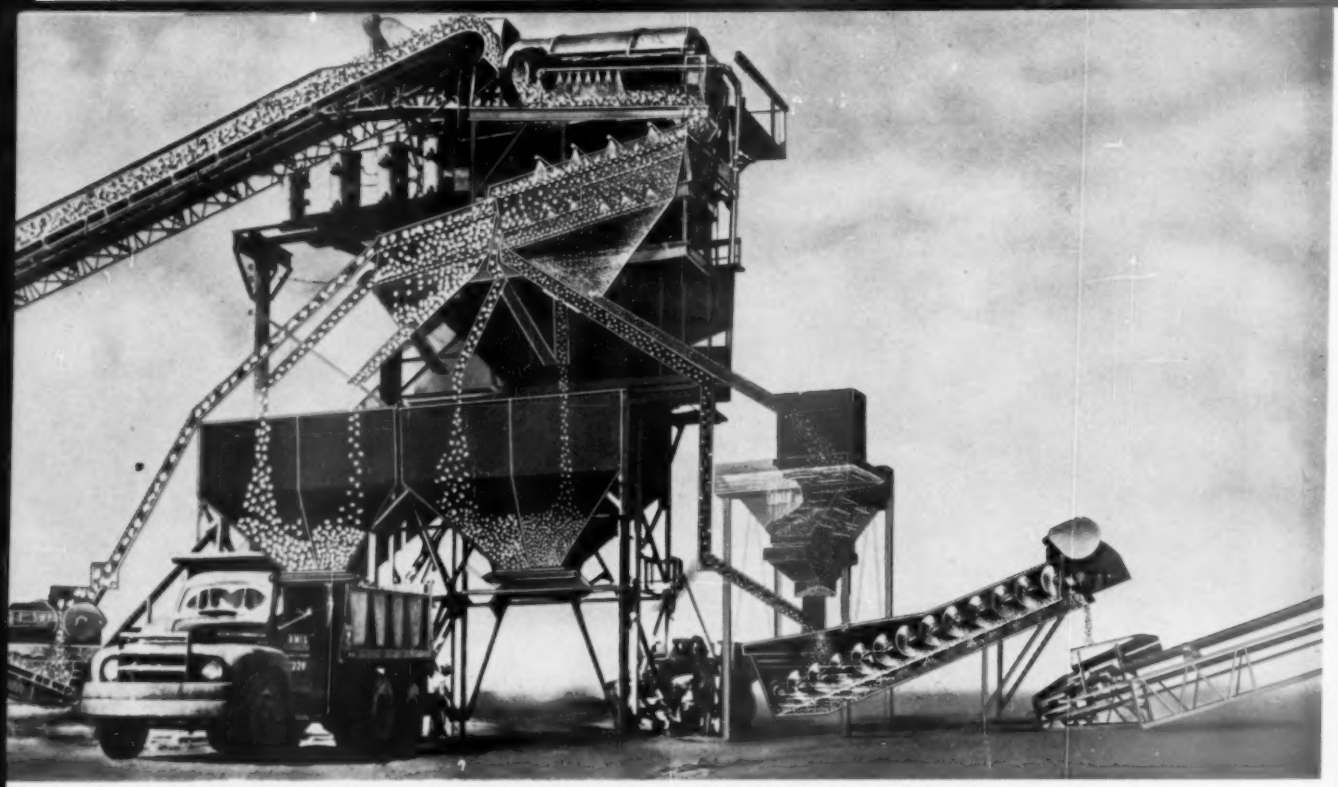


X-ray view of 150-tph. plant shows scrubber, screens, crusher, fines screw

Washing plants must be designed

You must know water's properties, best combination of equipment

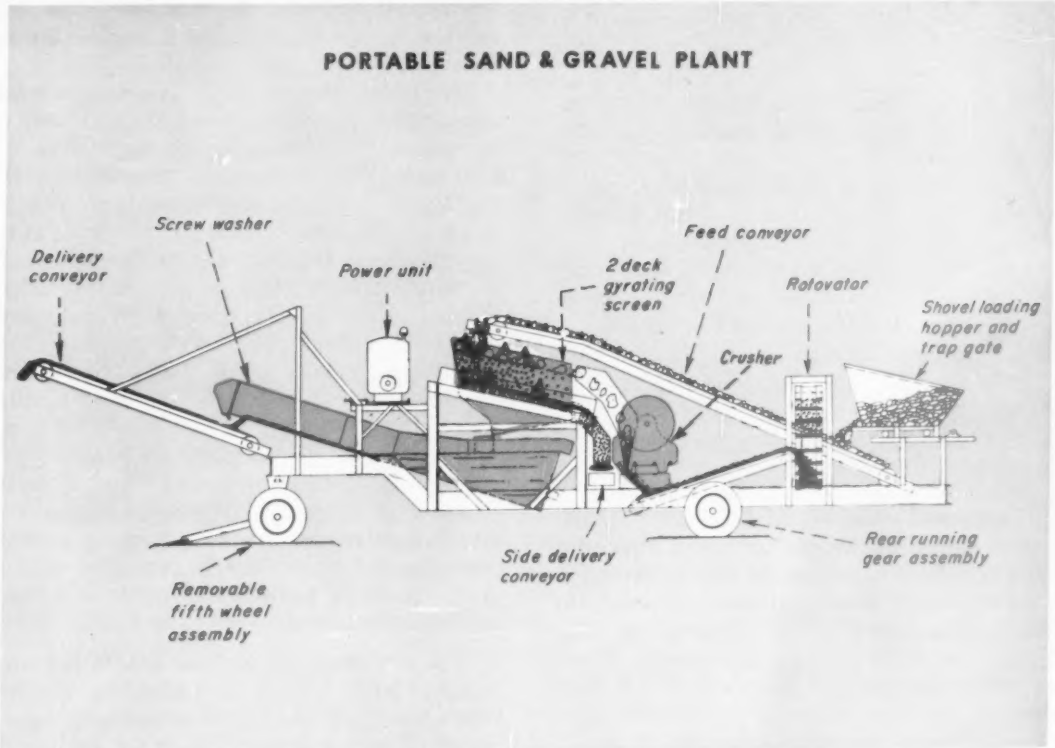
by William A. Rundquist

This article, last of a four-part series, ties together Mr. Rundquist's discussion with some ideas on plants designed for aggregates washing. See ROCK PRODUCTS, August, October and November for the first three sections of the article.

WE HAVE DISCUSSED THE REASONS why the proper washing of aggregates is important to the producer and have covered various units for handling the job. Now, keeping in mind the functions and operating characteristics of these units, let's consider some aspects of plant design.

The design of wet operation plants poses problems beyond those encountered in dry operations. In dry operations of crushing and screening, the variables are fewer and control is easier. In wet operations—mainly washing and sorting—there are additional factors to consider. Among these are water quantities, water pressures, nozzle characteristics, grain sizes and specific gravities, liquid densities, particles in suspension and overflow velocities. With consideration of these factors must go a fairly comprehensive understanding of the types and kinds of equipment and the combinations most likely to produce the desired results. Hydraulics, in itself, is a specialized phase of engineering; when applied to the processing of minerals, including sand, it becomes specialization within specialization. Of course, a great many producers of washed aggregates have been successful in spite of meager knowledge of the subject.

Chances of failure can be minimized, however, if the would-be producer will first use the "specialist services" offered by most reputable manufacturers of wet processing equipment. Furthermore, it should be remembered that the most ingenious or elaborate layout is not always necessary for highly acceptable results. In most instances, water is water; the secret of a successful operation lies



Portable plant has enough oversize to warrant use of crusher

in controlling the amount and the way it is used to produce a desired effect.

For this reason, the best course is to lay out the plant so that the least amount of equipment need be installed, with provision during design and planning for later installation of additional units or types of equipment as required.

The need for adequate testing and analysis of the source material prior to planning of any installation cannot be emphasized too strongly. It could be that some of the smaller material sizes do not exist in adequate quantities to meet specification requirements. Perhaps some other location should be considered. If this is not feasible, some sand fractions may have to be manufactured.

If the pit-run is deficient in some of the larger or intermediate fractions, some of the product in the coarse size range, say ¾ in., might be processed through a roll crusher or a cone crusher, or, if it is not too abrasive, through a hammermill, with subsequent screening, wet classification and blending. When the deficiency exists in the finer sizes, say from 16 mesh on down to 50 mesh, a rod mill may be required. If deficiency exists in fractions below 50 mesh down to 200 mesh, a ball mill may have to be considered. Experience seems to favor a wet feed to the rod mill. This reduces rod and liner wear, theoretically gives better product control and permits pumping the mill discharge back to a screen, classifier or to a ball mill in series with it. The preference is for a wet grinding operation in the ball mill for the same reasons, plus the fact that the ball mill can be operated in closed circuit with a classifier.

Many sand and gravel pits in areas formerly abundant with raw materials have become depleted. In such pits, large stones above 8 in. have been discarded. Some of these boulders will undoubtedly have to be processed to keep pace with the accelerated highway construction program. If so, the necessity for producing manufactured sand will be accentuated.

Obviously not every producer will be faced with the need of going to such great lengths to produce satisfactory washed aggregates. For every complex gravel or rock plant, there are probably a dozen or more less complicated installations doing a completely satisfactory job.

The three general types of plants are the stationary plant, the semi-portable plant and the portable plant:

* The stationary plant is installed for long-time use at one location for production to meet the needs of a specific market. Its arrangement will be

of a permanent nature, although it may not differ greatly from a semi-portable plant in size and scope of operations.

* The semi-portable plant is generally composed of units grouped and combined in such a manner that they can be dismantled quite readily for moving. Transport may be by truck or trailer, although in many cases axles and wheels can be attached to the units themselves for hauling.

* The portable washing plant is equipped with wheels for easy moving. This type of plant will probably increase in popularity and application as more job-site washed aggregates are required on construction projects.

Stationary and semi-portable plants are similar in general design and applications, so a discussion of one will suffice. Actually, the only difference is that the stationary plant auxiliaries are generally selected and arranged for more permanent location. It will be assumed that the material, before being fed to the washing plant, either has been crushed and screened to size or is produced from a raw supply requiring no pre-crushing. If the latter is true, the initial operation may be wet or dry depending on whether the raw supply is taken from below ground water level or above it.

Here is the washing sequence in a plant (see first photo) of about 150-tph. capacity: Pit-run material is loaded into a mechanical feeder that empties onto a conveyor for elevating to a 6 x 12 ft. revolving scrubber. After being thoroughly scrubbed, sand, gravel and water pass to a 4 x 20-ft. tandem vibrating screen where they are rinsed and sized. Oversize requiring further processing is chuted to a roll crusher where it is reduced and fed back into the raw material by a return conveyor and transfer system. Sized gravel is passed by chute into bins for storage and loading, while concrete sand is spouted to a screw dehydrator, and masons sand is spouted to a water-scalping tank.

The sand-producing section of this arrangement offers unusual flexibility. For the sake of some figures, assume that the top deck of the three-deck screen has ⅜-in. openings, the second deck is No. 4 mesh and the bottom deck is No. 8 mesh. By the arrangement shown, the No. 4 x No. 8 sand can be mixed in any proportion either with the ⅜ in. x No. 4 or with the minus No. 8. If minus No. 4 is required, the No. 4 x No. 8 will be spouted to the screw classifier and as much of the minus No. 8 as may be required will be blended in from the scalping tank. Of course, if both No. 4 x No. 8 and minus No. 8 are to be produced at the same time, two screw classifiers will have to be used. Note that the spouting set-up can be arranged so that any desired portion of the minus No. 8 can be fed into the No. 4 x No. 8 before it reaches the screw classifier.

Frequently it is desirable to set up a washing and sizing plant in such a way that the sand plant is separate from the units producing the coarse aggregate. This is especially true where pits run heavily to sizes ranging down from pea-gravel (minus ⅜ in.). By so doing, it is possible to reject pea-gravel size if it is in excess. Production of 100 percent fractured chips is possible by using the crusher and returning material to the vibrating screen, by-passing the revolving screen.

A further advantage is that such an arrangement minimizes stacking of units, thus facilitating dismantling and moving. Also, a plant of this general design permits use of either section separately when conditions warrant. It is one of the better types of plant for job-site washing and sizing for heavy construction projects, working in material that does not require a large revolving scrubber or a log washer. If a water scalping tank is required, a slurry pump can be used to load it.

The usefulness of portable plants for washing aggregates is limited by availability of adequate wash water and the extent of auxiliary equipment required to complete the plant for the job. These auxiliary items may include scrubbers, log washers, coarse and fine material screws, scalping and classifying tanks and bins. It may or may not be desirable to mount these units on rubber tires. Much depends on how extensive the use of these items will be on subsequent jobs. Thus the producer should always ask himself, "Should I invest the extra money required for the wheels and rubber, or should I buy a semi-portable plant and save some 'dough,' knowing that there will be some erection costs connected with the semi?"

Among portable plants available there are two basic types:

(1) Those having a "wet" vibrating screen followed by a dewatering screw or drag.

(2) Those with a revolving scrubber (for "dirty" material) followed by a sizing and rinsing screen and a dewatering screw.

In the latter, the screw may be a part of the plant itself, or it may be set up as an auxiliary.

In a typical portable plant of the first type, the main unit consists of a 5 x 12-ft., three-deck vibrating screen equipped with spray-bars and a 30 in. x 25-ft. fine-material screw washer-dewaterer. This unit can be used alone or with one or two coarse material screws, depending on the job to be done. When necessary, a log washer can be added to clean up the larger material. To make this type of plant completely portable, the coarse screws and log washer can be equipped with chassis and wheels. The coarse screw chassis also carries an

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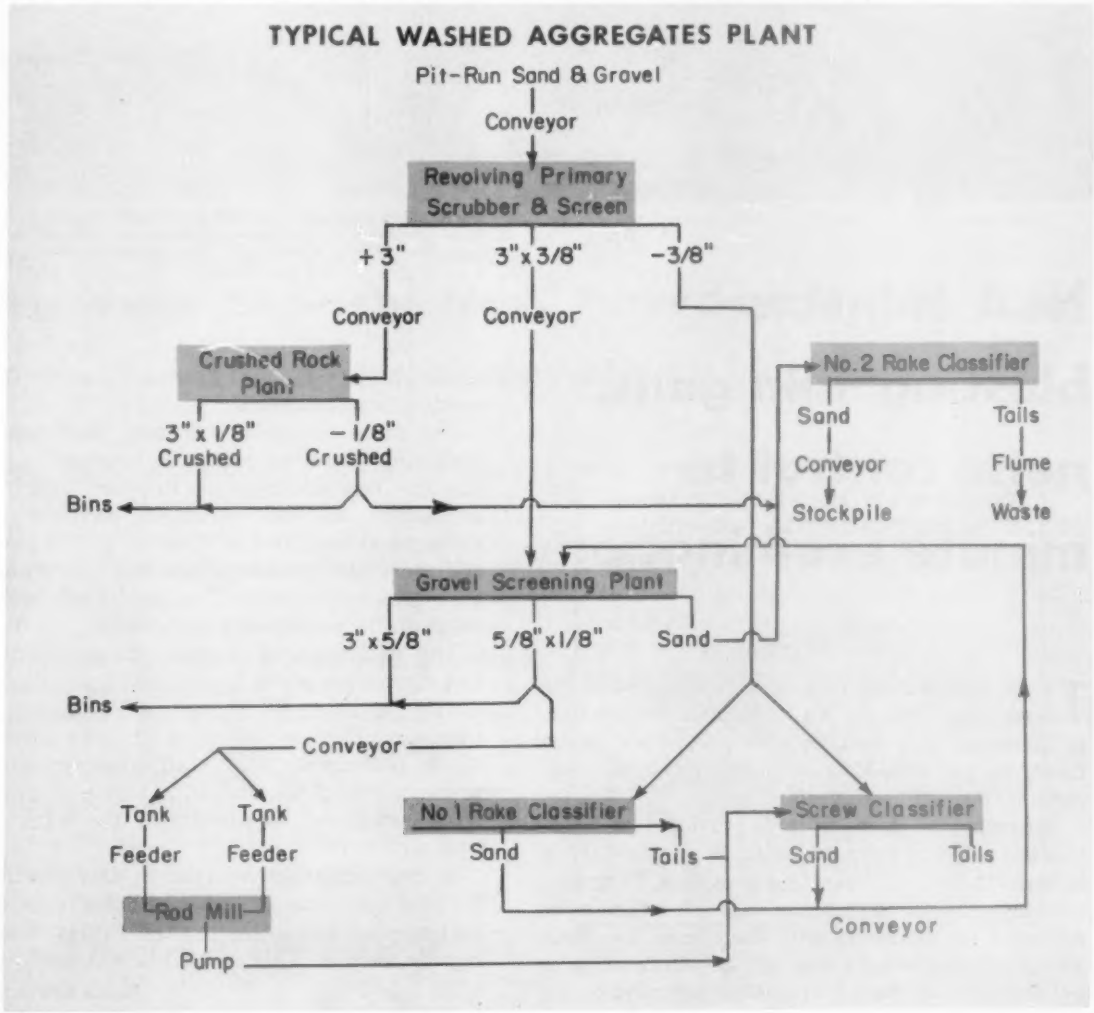
Main unit (center) of portable plant has three-deck wet vibrating screen, screw washer for fines washing and dewatering

Flow sheet for typical washed aggregates plant. Note use of crusher, rod mill to get needed sizes



Outstanding ammonium nitrate panel talks were introduced by NLA president M. A. Rikard. Others are, left to right, Dale Solze, W. J. Nice, Cecil Koger, Max Muller (meeting and program chairman) and Fred Witmer

NLA subjects blasting, kiln guns, noise control to minute examination

THOSE WHO MISSED THE ANNUAL MEETING of the Operating Division, National Lime Association, in Cleveland this past October missed an opportunity to get first-hand schooling on several important operating developments.

According to M. A. Rikard, president of NLA, it is the policy of the association to get right down to brass tacks in its operating meetings. Programs are designed to take advantage of information gathered by producers who sometimes use their plants, or components thereof, as laboratories to gather data on varied operating techniques. He really hit the nail on the head as far as the October meeting was concerned.

The panel technique was used to advantage in disclosing operating results in ammonium nitrate blasting, new developments in rotary kiln internal preheaters, and wet scrubbers on rotary kilns. Each panel consisted of four or five experienced engineers and operators, and the volume of data they presented would fill a good-sized book—too much to be presented here in detail.

The well-balanced program included an excellent discussion of the noise control problem in industry, by M. C. M. Pollard of National Gypsum Company. The problem of safety was covered by K. A. Gutschick, NLA staff member, who also presented the ROCK PRODUCTS safety trophies and NLA certificates to winners of the NLA Safety Contest for 1957.

A new technique, adopted at this meeting for the first time, was a "Nuts and Bolts" session that carried on for hours after the Friday afternoon regular session. This added bit was conducted

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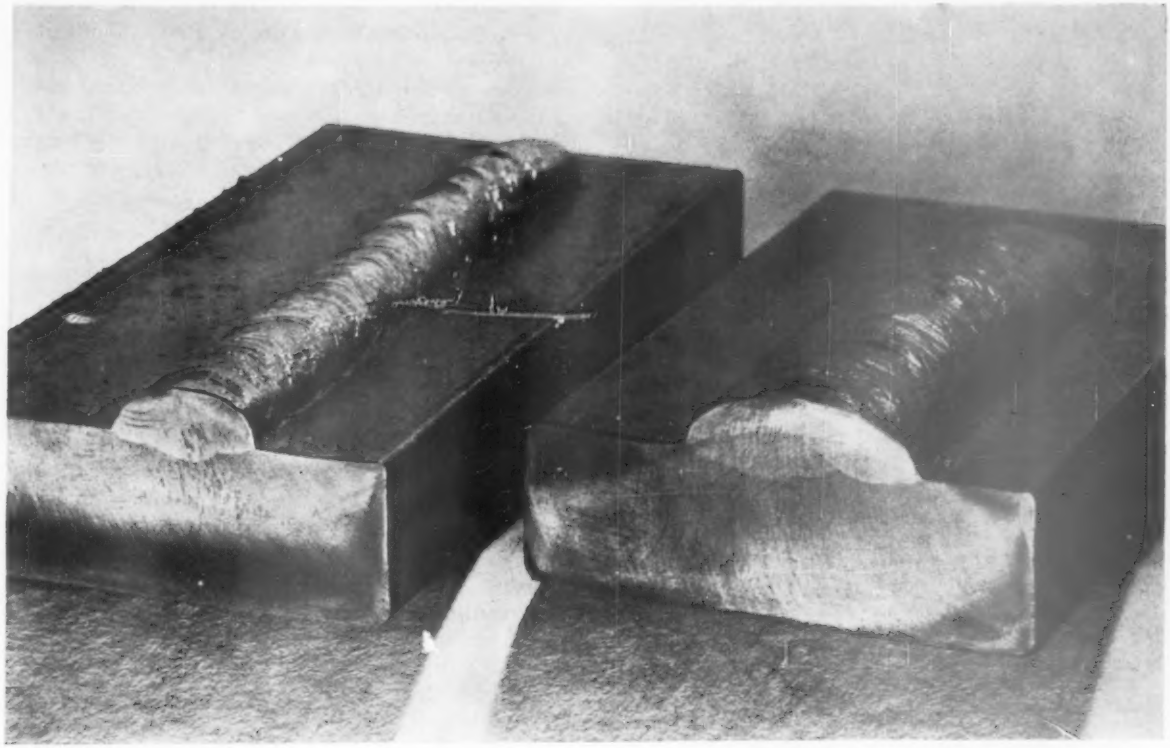

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ROCK PRODUCTS' safety trophies were presented by NLA's Ken Gutschick, who holds the award given to Ash Grove Lime and Portland Cement Co. Others receiving awards are, center, George Miles for National Gypsum Co., and Clarence Stielstra, right, Dow Chemical Co.

NLA meeting *continued from page 88*

an "organized informality" to allow additional direct question-and-answer periods for those who were interested further in subjects covered by previous panel discussions.

Ammonium nitrate blasting got full coverage by a panel consisting of C. Koger, John Gardner, L. E. Firestone, W. J. Nice and Dale Solze. Fred Witmer moderated the discussion. Each panelist described the rock strata at his quarry and the method of drilling and loading used. As would be expected, conditions varied widely among the quarries described. Size of holes drilled for use of ammonium nitrate at these properties ranged from 3 to 10¼ inches in diameter. Most added from 5 to 6 percent fuel oil, by weight, to the ammonium nitrate prills; some premixed up to 24 hours while others added fuel oil directly into the hole. According to data presented, savings through the use of ammonium nitrate blasting over the use of regular explosives formerly used ranged up to nearly 50 percent. The costs given included drilling and explosive costs.

The panel found several varied advantages with the use of ammonium nitrate. Most found that tons of rock broken up per pound of explosive used had increased. At least one mentioned savings of $40,000 per year. Reports showed that fragmentation improved, even in some cases when spacing between holes had been increased. A vote of the panel indicated that fines were reduced at 5 out of the 6 properties described.

Water, apparently, is the one big problem encountered with use of prilled ammonium nitrate explosive. Some are experimenting with methods of baling holes dry and others are looking at the new polyethylene bags that now are available.

Newly re-designed kiln guns are more effective and more safe than ones formerly available, according to W. G. Davis of Remington Arms Co. Mr. Davis recounted the history of development and use of such guns, which began in 1926. Most development has taken place since World War II as a result of an extensive research program conducted by the company.

It was found that there are two major causes of noise with use of kiln guns: (1) result of muzzle blast, and (2) result of the slug travelling through the sound barrier. All of this research led to the re-design, since 1945, of the company's kiln gun that resulted in these improvements: (1) better life of barrel, (2) development of a shield to protect the gun operator, and (3) gun life has been lengthened. In all modifications of the kiln gun, Mr. Davis pointed out that safety is paramount.

Lime manufacture around the world, as reviewed with the use of colored slides taken by Victor J. Azbe on his recent globe-circling trip, can be good or it can be primitive. Stone itself is a major problem in the countries that Mr. Azbe visited. After seeing the conditions in other countries, Mr. Azbe suggested that lime producers in the U. S. should feel extremely fortunate with the raw material they have to work with.

It took Mr. Azbe 50 years, not three months, to make his trip around the world. He first arrived in this country in 1907 on his first attempt to make the trip, but became interested in combustion of fuels and in lime manufacture. As he put it: "Lime took me around the world 50 years later."

A new kiln at Chemstone Corp.'s Strasburg, Va., plant was completely described by W. A. Roberson, chief engineer for the company. The company added two kilns in 1956 and two more the next year. The plant was designed for maximum effectiveness in materials preparation and handling and was converted to push-button operation wherever possible. Kilns are fed with minus 1½-in. stone every two hours. Rate of feeding, which is done by push-button, is five tons per minute, so that it takes only three minutes to fill a kiln.

The kilns are designed for continuous operation. Natural gas is the fuel. Flexibility in kiln controls is such that kilns may be operated automatically

Please turn to page 92

Chevrolet's new El Camino combines fresh beauty with a husky pickup box that's 76¼" long, 64¼" wide.

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Internal preheaters for rotary kilns get a practical review by this panel. Clarence Stielstra moderates

NLA meeting *continued from page 90*

or manually. Continuous recording temperature charts are installed. Temperature of exhaust gases is in the 550 deg. to 600 deg. F. range.

Drawing of the kilns is done by a timer, for it has been found that a small stone kiln must be operated continuously to keep down the buildup of scale on kiln walls. Gas used as fuel is clean and is easily controlled and instrumented. The plant averages less than 5 million Btu. per ton of lime produced.

A new color film on "Lime Stabilization of Roads"—the only one ever made by NLA—is getting more than just a good reception. The film was shown to the group, and praise for Bob Boynton and Ken Gutschick for their excellent work in putting it together was high, indeed.

Promotion of lime stabilization has been enhanced considerably by the film; there now is used for such work more than a quarter of a million tons a year—more than is used in the pulp and paper industry. So far, 19 copies of the film have been sold to lime and affiliated companies—even to German, Swedish and Canadian lime companies. By next January, 30 different highway departments will have seen the film. The film itself shows excellently the use of lime in stabilizing roadways from Interstate Highways to farm-to-market roads, airport runways, parking lots, city streets, etc. According to the film, 2,500 miles of roads in 22 states have been built with lime, and its use is increasing.

Rotary kiln internal preheaters and their use at several plants was the subject of the second panel discussion on the program. Clarence Stielstra moderated the panel that consisted of Gordon Lacey, Marshall Parsons, Fred Warner and Clarence LaLiberte.

Data given by panel members included a description of the installations of preheaters that ranged from tripartite to sexpartite in type. Difficulties experienced and benefits gained were discussed in each individual case.

Major benefits with the use of alloy-steel internal preheaters included increases in production with greater fuel efficiency, according to the panelists. Some said that, when the unit was removed, production dropped by 17 percent. Alloy steels make a good material for the surface. One panel member stated that structural problems have been the major ones. Another problem stated was that of lining wear caused by the stone. In some cases, replacement of worn tile gave a net gain of 20 percent in production and an increase in the fuel ratio. In other cases, no appreciable tile wear was noted in 15 ft. of refractory heat exchanger after 14 months of operation.

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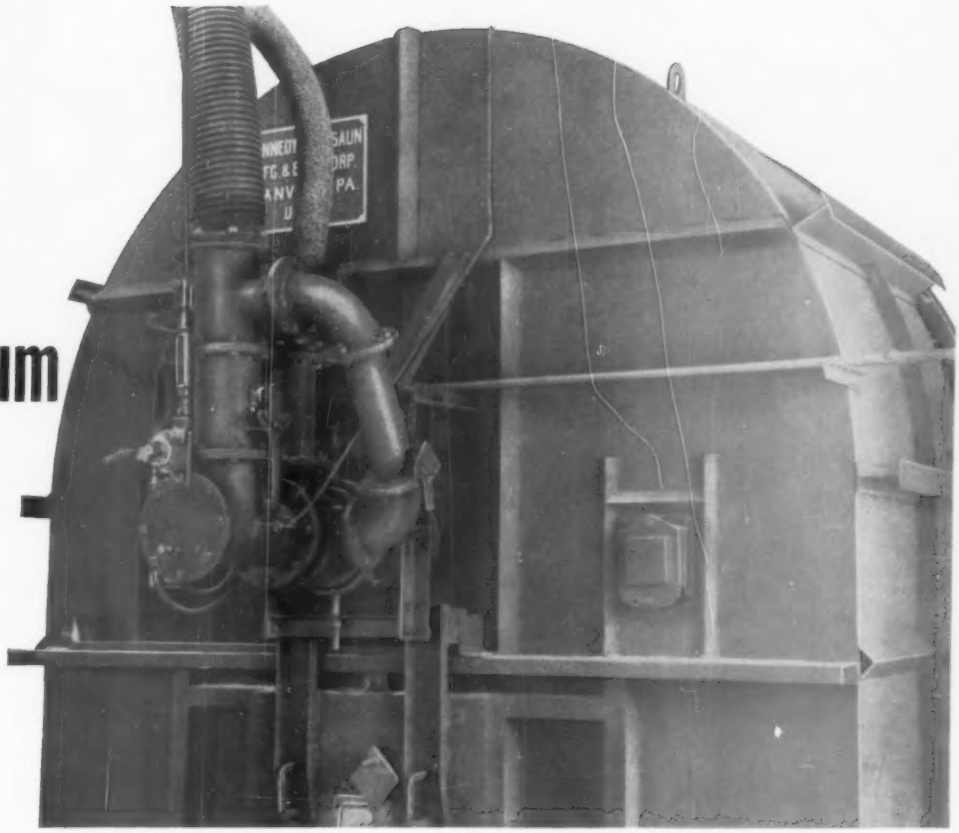

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New lime film has received wide acclaim, says Bob Boynton, general manager of NLA

NLA meeting *continued from page 92*

Wet scrubbers on rotary kilns have improved the public relations situation by removing dust, and also have improved firing, according to a panel member who discussed "Wet Scrubbers on Rotary Kilns." C. C. Addams moderated the discussion of these panel members: William Ash, Lawrence Maloney, Sam Bricker and William Tock.

Like the former panel discussions, volume of information given was too much to report completely. However, there are definite benefits that go with the use of wet scrubbers, and there are definite problems. One summarized that there probably are as many types of scrubbers being used as there are installations, and each has its own peculiar set of difficulties and benefits. Corrosion of the fan was one problem mentioned, and research showed that weight loss can be reduced with special alloy steels. Big trouble spot with another installation was the wearing effect of ledges in the installation. Bolted construction gave trouble also; it was suggested that welding would be a better method of fabrication. Regular cleaning was mentioned as another must for such installations, to keep down corrosion and to maximize efficiency.

Safety awards of NLA are still obtainable for 17 plants in the 1958 contest—or were at the end of August—according to Ken Gutschick, who gave 9 awards to plants that had no lost-time accidents in 1957. The nine winners included: Galloway plant, Ash Grove Lime and Portland Cement Co.; New Braunfels Plant, U. S. Gypsum Co.; York Plant, National Gypsum Co.; Millville Plant, Jones & Laughlin Steel Corp.; Kimballton Plant, National Gypsum Co.; Ludington Plant, Dow Chemical Co.; Peerless Vertical Plant, Mississippi Lime Co.; Springfield Plant, Ash Grove Lime & Portland Cement Co.; and Buffalo Plant, Kelley Island New York Corp. Mr. Gutschick also awarded a 1,000-day certificate to Ash Grove Lime and Portland Cement Co.'s Galloway Plant.

ROCK PRODUCTS' safety trophies were awarded to the winning plants in each category. There were winners only in Classes A1, B and C this year. The Class A1 award was presented to Paul Sunderland for his company's Galloway Plant. George H. Miles accepted the award for the Kimballton Plant of National Gypsum Co., winner in Class B competition. The Class C award went to the Ludington Plant of Dow Chemical Co., and was accepted by Clarence Stielstra.

Noise control in industry is a growing problem, and one that should receive more attention. An excellent discussion of the problem was given by M. C. M. Pollard, safety director for National Gypsum Company. He described the progress his company has made after seven years of conducting noise surveys in plants. He suggests that industry still has a big job to do to get relief from the industrial noise "disease". First, he suggested that each operator survey all operations to find out the source and volume of noise. Then, screen hearing of all employes with the use of an audio-meter; he warned that the meter must be used for screening only. After you have found the noise, its volume and source, you can do two additional things. You can provide, as a temporary measure, protective equipment for employes—and see that it is used. Secondly, look for a practical method for controlling the noise. If, after the practical methods have been tried and hearing of employes still is being impaired, Mr. Pollard suggests that you consult the experts.

The meeting was jam-packed with practical information, and was one of the best held by NLA. Credit was given to Max Muller of Basic Incorporated, who chairmanned the meeting and also was program chairman; to R. E. Gill, chairman of the operating committee; to William Tock, arrangements chairman, and to Clarence Stielstra and C. C. Addams who comprised, with the others, the operating committee.

END

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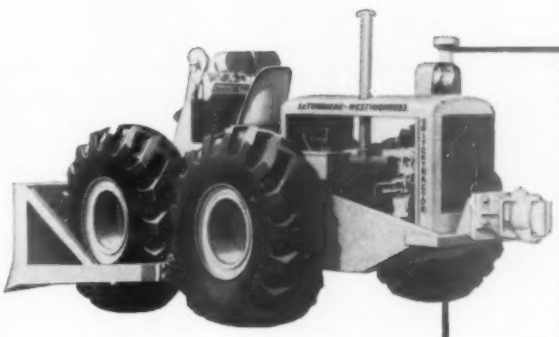

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NSGA spotlights freight rate progress

Public relations, taxes also discussed at NSGA September conclave

FABULOUS LAS VEGAS, NEVADA, was the scene of this year's September-October meeting of the National Sand and Gravel Association. Location of the meeting had more than its share of good points, but it was no more colorful than the reports of action given by committees covering association business. Consensus seemed to be that it was a good place to meet, and that it was an excellent meeting.

Highlighting the meeting, chairmanned by president E. Phil Gemmer, were reports of positive action taken by the Traffic Committee in the battle of freight rates for sand and gravel. The hard-hitting combination of Ellis E. Jensen, Janesville Sand & Gravel Co.; Charles E. Brady, chairman of the Traffic Committee; his committee members and the Washington staff members has made a greater dent in the problem this past year than ever before. Individual work of members cannot be overlooked in this connection.

It was Mr. Jensen, who, at the 42nd Annual Convention in Chicago last February, gave the industry a potent weapon for fighting what had been up until then a losing battle of rising rail rates. He literally threw a bombshell into the ICC's cost-finding system—to such an extent that even the railroads and ICC have some doubts about relying solely on the Bureau of Accounts figures (see ROCK PRODUCTS, July, 1958, p. 74).

Mr. Brady reported on the special rate history in the south. A conference of shippers and traffic executives of southern railroads resulted in setting up what was called a New Orleans Scale in 1949. Since that time, Ex Parte 175 added a 15-percent increase to the New Orleans Scale, Ex Parte 196 added 6 percent, and in 1957 the ICC authorized in Ex Parte 206 another 9-percent increase.

Eventually, in September, 1958, after hard work by key shippers in the south and a sudden realization by carriers in Florida that much of the anticipated movement of rock products was going to trucks, a new scale was agreed upon. In no instance is the new scale as much as 10 percent above the 1949 New Orleans Scale. This surely is a victory for Mr. Brady and his committee, and for many individuals who helped.

The main fault with the railroads, according to Mr. Jensen, is that they still think their competition is other railroads. But actually, their greatest competitor is truck haulage. In his valuable study, Jensen showed that the ICC and most railroads aren't sure of sand and gravel freight costs. For details on this subject, it is recommended that you study the NSGA publication titled "The Cost of Transportation of Sand and Gravel by Rail." According to some, this is one of the best efforts of the association and a most valuable contribution by Mr. Jensen.

Please turn to page 100

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YOUR GRADER—

PRODUCTION TOOL?

...or OVERHEAD?

Chances are, you consider a grader a maintenance tool . . . a kind-of "necessary evil." But is it just that?

Think how a grader keeps haul roads in top-speed shape — thus increasing the number of round-trips your haulers can make daily. Or think of the extra working days you gain because ditches, cut by a grader, let water run off faster.

Objective . . . increased production

The net result of most grader work in mines, quarries, and pits, is higher output . . . increased production. In a sense, the extra tonnage you get — due solely to work of your graders — is really *their* production. It's output you wouldn't get without graders . . . couldn't get without added expense.

So! While your grader may be a "maintenance" tool in function, it is actually a "production" tool in results. That's why you will want to select your graders carefully, on the basis of work-output. You'll want machines that can handle *all* your blade-work *fast* . . . that can help you get the "last ounce" of tonnage with your production equipment.

L-W "660" does more work, faster

You'll find that a big L-W Adams† 660 grader can cut deeper, push more dirt, move it faster than other graders of similar size, price, and power. "660" gives you greater work-output than others — mainly because of its wide selection of power-speed combinations, which let you do more of your work at full engine-power. The L-W grader also provides extra, faster forward and reverse speeds to save you time on traveling, maneuvering, and backing-up for the next cut.

This profit-boosting grader is offered in 2 power options: Standard "660" with 160-hp diesel and constant-mesh transmission, or POWER-*Flow*® 660 with 190-hp engine and torque converter. Five other L-W Adams model graders — 60 to 135 hp — also available.

Call or write for complete information about features that make LeTourneau-Westinghouse machines the most profitable graders you can own.

†Trademark G-1884-MQ-1

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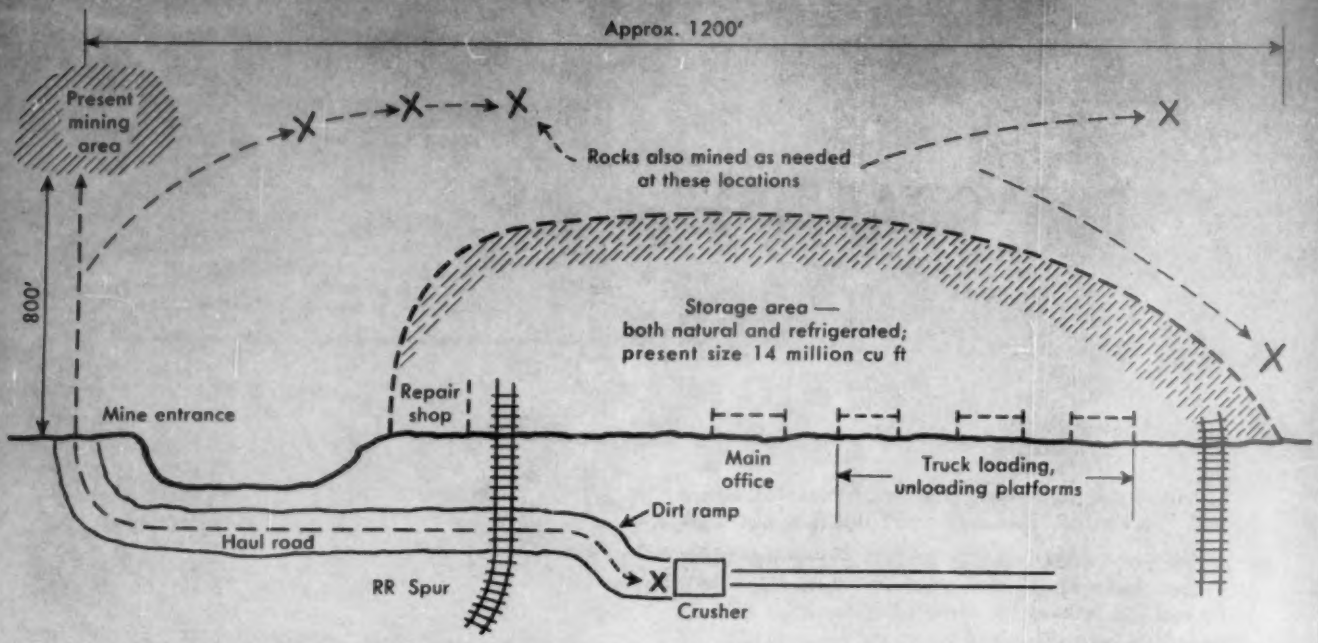

Sketch shows present operations of Loring Quarries' mine. Haul distance for Rear-Dumps — from shovel to crusher on top of high dirt ramp — averaged 1320'. Company is currently producing concrete aggregate, bituminous mix, road base, block plant-material, and agriculture limestone. In 1951, the firm began construction of a huge underground cold-storage plant . . . to make use of excavated space resulting from mining out the rock. Present capacity of the cold-storage plant is 14 million cu ft. It is divided into natural and refrigerated compartments. Spur tracks from the main railroad line enter the storage area for easy removal of cargo. In addition to the storage plant, numerous offices and a large, modern repair shop are also located underground — in the mined out limestone cliffs.

Loring's 11-ton D Rear-Dump deposits capacity load of limestone rocks into 300-ton-per-hour primary crusher. Another of the firm's 4 Rear-Dumps is spotted and ready for quick back-up to unload into hopper. Note "beehive" entrances to the company's underground offices and storage areas.

Two empty Rear-Dumps at right return to mine, as loaded machine at left starts haul to crusher. The short-turning 138-hp units are shovel-loaded with shot limestone about 800' inside mine. Says Mine Superintendent Clyde Edmonds, "Rear-Dumps keep us ahead of schedule, because they require less maintenance and repair. These machines do everything asked of them . . . and they're dependable."

Short turns with electric wagon-type steer proved a major advantage in positioning at shovel and hopper, and for maneuvering in all tight spots in mine. With body in travel position, D Rear-Dump makes continuous 180° turn in 24'8" — in dump position in only 18'8". Commented Operator Gary Leach, "This hauler is sure easy to operate and control . . . less tiring than other equipment. Has much better maneuverability."

How Underground Quarry solved haul problem with pivot-steer haulers

Finding the right tool for the job — to insure highest production and lowest operating costs — often is a costly, time-consuming task. Read this report on how a large producer of crushed limestone — Loring Quarries, Inc., Bonner Springs, Kansas — solved a difficult hauling problem with electric-control pivot-steer haulers. Their experience may save you time and money.

Tried two "D's", bought two more

With underground mining operations located beneath limestone cliffs near the Kansas River, Loring Quarries required a hauler that could: (a) work in tight quarters; (b) carry a good load to crushing plant fast, and; (c) be able to cut hauler maintenance and repair costs. A number of machines were tried, but none could meet all requirements.

The firm then purchased 2 LeTourneau-Westinghouse D Tournapulls® with 11-ton Rear-Dumps. Put to work on Loring's tough haul assignment, the results were outstanding. Highly pleased, the firm added 2 more Tournapull haulers within the next two years.

"Very satisfactory"

Four years after purchase of the 1st unit, Mr. E. P. Conlan, Vice President of Loring Quarries, says, "Our experience with D Rear-Dumps has been very satisfactory. We like the fact that 'D's' have no frames to twist and break, no dual tires sticking out into the loading zone to pick up sharp cutting rocks. And, with the electric-control dump, there are no hydraulic lifts to maintain. They're built simply . . . far easier and less expensive to maintain, both mechanically as well as on tires."

Ask for a demonstration

Let us show you how rugged LeTourneau-Westinghouse Tournapull Rear-Dumps can help lower *your* hauling costs. Available in 3 sizes: 11, 22, and 35-ton capacities. Call or write for complete information.

DR-1821-MQJ-2

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Top officers representing NRMCA were, left to right, John B. Donovan, vice president, M. Eugene Sundt, president, and F. E. Schouweiler, vice president

NSGA meet *continued from page 96*

What to do about the problem of freight rates? Jensen suggests, first, to keep going after the ICC to accept a more reasonable and accurate cost basis. Secondly, spend more time in presenting the good case for sand and gravel to the State Commissions and staff members. Then, take the problem up directly with the individual carriers.

Progress in public relations efforts of the association were reported by E. K. Davison, chairman of the PR committee. In his opinion, most significant developments in the committee's work have taken place since the last meeting.

First, the Industrial Hygiene Foundation of America, affiliated with Mellon Institute, has been conducting dust and noise surveys for the association. Although the final report will not be ready for several months, information already at hand shows that unpaved roads in plant areas contribute more to dustiness than do the plants. Also, a plant itself does not produce noise to be compared in annoyance value with that generated by trucks. The completed study will have value to the association and members in that (1) facts on noise and dust will be made available from a reputable organization; (2) the report is expected to demonstrate difficulty that a public body may run up against if it wants to set up maximum standards for dust and noise; and (3) the report may set forth the maximum that a plant can meet, if specific standards can't be avoided.

The second area of progress noted, possibly the most important in the PR effort of the group, is the publication of Pete Ahearn's booklet titled "The Zoning Problem and Its Significance to the Sand and Gravel Producer." Hundreds of copies of the book have been sent out to planning officials and to members of the National Industrial Zoning Committee. Both the author and the association have been complimented most highly on their evident responsibility in land use. Through the NIZC, the association was invited to join, and did, the American Society of Planning Officials and the Urban Land Institute. This work of NSGA, Pete Ahearn and its PR committee, plus the excellent land restoration projects of its members, has given NSGA national recognition. Confidence in the association has been expressed by planning and zoning bodies throughout the country.

The third area of progress is work that is now being done toward publication of a manual of land rehabilitation. Much of the material has been collected, and it is hoped that the project can be brought to conclusion by next spring.

The report on taxation, presented by J. Rutledge Hill and discussed by V. P. Ahearn, wasn't as rosy as reports on other areas of activity. Rather, directors were warned that the apparent attitude of Congress toward percentage depletion has changed. One analysis is that percentage depletion as a national policy is under attack. Certainly, percentage depletion for sand and gravel serves the public interest. But it will be up to individual members to bring the facts to their national representatives and senators.

The Technical Amendments Act of 1958, however, was good for the industry in some respects. One favorable point is that it permitted producers to aggregate mineral properties for the purpose of setting up allowances.

Research activities of the association are forging ahead, but there are many problems that need to be worked out. Stanton Walker reviewed some of these problems with respect to use of aggregates in runway and pavement construction. Specifying concrete on the basis of flexural strength, particularly on the eastern seaboard, may give sand and gravel a disadvantage. Sawed joints seem to be the trend now, but with the development of new equipment to handle the job, the problem is decreasing in importance.

Building code requirements for fire resistant concrete have caused some trouble. Fire underwriters have made a differentiation between siliceous and calcareous aggregates, but efforts are underway, through the Building Conference of America, to bring about revision of some city codes that now put gravel at a disadvantage.

A bright spot in the picture is the fact that new specifications have allowed for more liberal use of sand and gravel in bituminous mixes. Obstacles to its use are much fewer now than in the past.

Some headway is being made in the railroad ballast market, which has declined to 3 percent of commercial production. The subject is being kept alive. There is hope for the use of more

Please turn to page 102

Use same L-W prime-mover in stripping and hauling

You save on original equipment investment . . . and reduce operating costs

Stripping overburden is different from mining out pay ore or rock. It is basically a *scraper* job—can be handled most economically by modern scrapers. They leave your shovels and haulers free to maintain steady production.

Yet, since stripping is not a continuous operation in most pits, you need a multi-purpose machine—one that can quickly switch over to hauling shovel-loaded material when you catch up on stripping of overburden.

You get this advantage with the LeTourneau-Westinghouse Tournapull® line. These L-W machines keep equipment investment and operating costs low *all year long* because of their interchangeability feature (see panel). The prime-mover—major part of your original machine investment—interchanges with a variety of profit-making work trailers for other specialized duties. They handle your stripping, land-leveling, roadbuilding, pit-hauling, and waste product disposal efficiently, and at low cost.

Cut costs on your operation

The next time you consider investing in new stripping or hauling machinery, investigate Tournapull. Ask about the multiple work bonus you get (at fractional cost) from its interchangeable L-W trail units. Ask for specifications and prices on all 3 sizes. All have road speeds of close to 30 mph, ability to turn 180° non-stop in less than their own length.

L-W Tournapull Scrapers in 3 Sizes

Size	Diesel HP	Maximum MPH	Bowl Yards	Capacity Tons
B	335*-325	30.0	28	32.5
C	210	29.9	18	20.0
D	138	29.5	9	10.0

*when torque converter is specified

Interchangeable Rear-Dump

Tournapull scrapers interchange with other L-W trailing units behind the same prime-mover. For pit work, the Rear-Dump offers economical hauling ability, and simple operation — plus all the advantages of Tournapull speed and mobility. Bowl capacities are 35, 22, and 11 tons. Other L-W trailing units, suitable for pit and quarry work, include bottom-dump and side-dump haulers.

P-1860-MQ-1

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Freight rate progress gets spotlight at NSGA meet

NSGA meet *continued from page 100*

gravel as crushed material, since specifications allow up to 40 percent crushed particles.

There is a problem in beneficiation, since the industry is faced with tighter specifications. A major problem here is that specification writer engineers assume that the industry now has all the equipment and methods available to produce all gravel to specifications. It is suggested that the specifications be made more realistic.

Several important questions were raised for discussion by the group by V. P. Ahearn, NSGA executive secretary. Negotiations are continuing with the Solicitor, U. S. Department of Labor, pressing NSGA's objection to an opinion that aggregate plants located off the site of a project, but erected exclusively for the project, are subject to the Davis-Bacon Act. In some cases, portable plants are being set up in self defense, to get around the Act. The association's annual report on production and value was reviewed, as was the NSGA safety contest. The latter is moving ahead, with increasing participation by members. A full report now has been sent to members.

Mr. Ahearn also reported that the Transportation Act of 1958 gives the ICC much greater power over intrastate rates than they have ever had. Another point made was that a study of aggregates used in the highway program of the U. S. shows that the commercial sand and gravel industry is getting only part of the highway market.

Other reports included one by Fred P. Curtis for the Joint Committee on Labor Reporting Services in connection with the wage study questionnaire. A new strike reporting service already has been launched. It is considered to be of value and will be continued.

J. Craig McLanahan reported for the Manufacturers' Division. The group now has 104 members, which is considered good for a year in which no show is given. The next exposition will be held in Chicago in 1960. It will be housed in the Coliseum and the Conrad Hilton Hotel again, since the new Chicago exposition building will not be ready by then.

Board action also included the election of Alexander Foster, Jr., retired, to honorary member for life. It also adopted a budget for 1959, changed the fiscal year from that beginning on March 1 to a calendar year basis, and adopted the practice of billing dues on a quarterly basis.

The Joint Meeting of the NSGA and NRMCA was called to order on Oct. 2 by Eugene Sundt, NRMCA president. Topics of interest to both associations were discussed, including Group Insurance and Retirement Plans, recent developments in connection with mobile radio, research programs, and important doings in legislation and labor.

Use of mobile radio is becoming more and more important to producers in both the sand and gravel and ready-mixed industries. And recent developments have made it necessary to take action in setting up frequency allocation committees. The Federal Communications Commission now requires that radio frequencies be set up either through a committee or by a complete engineering study. Both industry groups have combined with others to set up a frequency allocation service, and their work has increased their stature with the Federal Communications Commission.

Special Industrial Radio Service Association has been reorganized to carry out the requirements of the FCC. Through it, provisions for industrial organizations and individuals will be made to set up a revenue plan for its operation. Since it is so important that this work be carried forward, it was suggested by William J. Hicklin, chairman of the Committee on Mobile Radio, that NSGA, and individual NRMCA members join SIRSA. It was agreed to do so, and Mr. Ahearn was appointed to represent NSGA on SIRSA, and Ken Tobin was appointed to represent NRMCA.

According to present rules of FCC, any member of the two associations can use mobile radio. A survey made a few months ago showed that 415 member companies were using more than 800 base stations and 8,400 mobile units. It is estimated that value of radio equipment they are now using is more than 5 million dollars.

Research work of the joint associations is being carried on successfully, according to John W. Roberts, past president of NRMCA and chairman of the Joint Research Committee. He reported briefly on the investigations now underway and stated that a complete outline on future research

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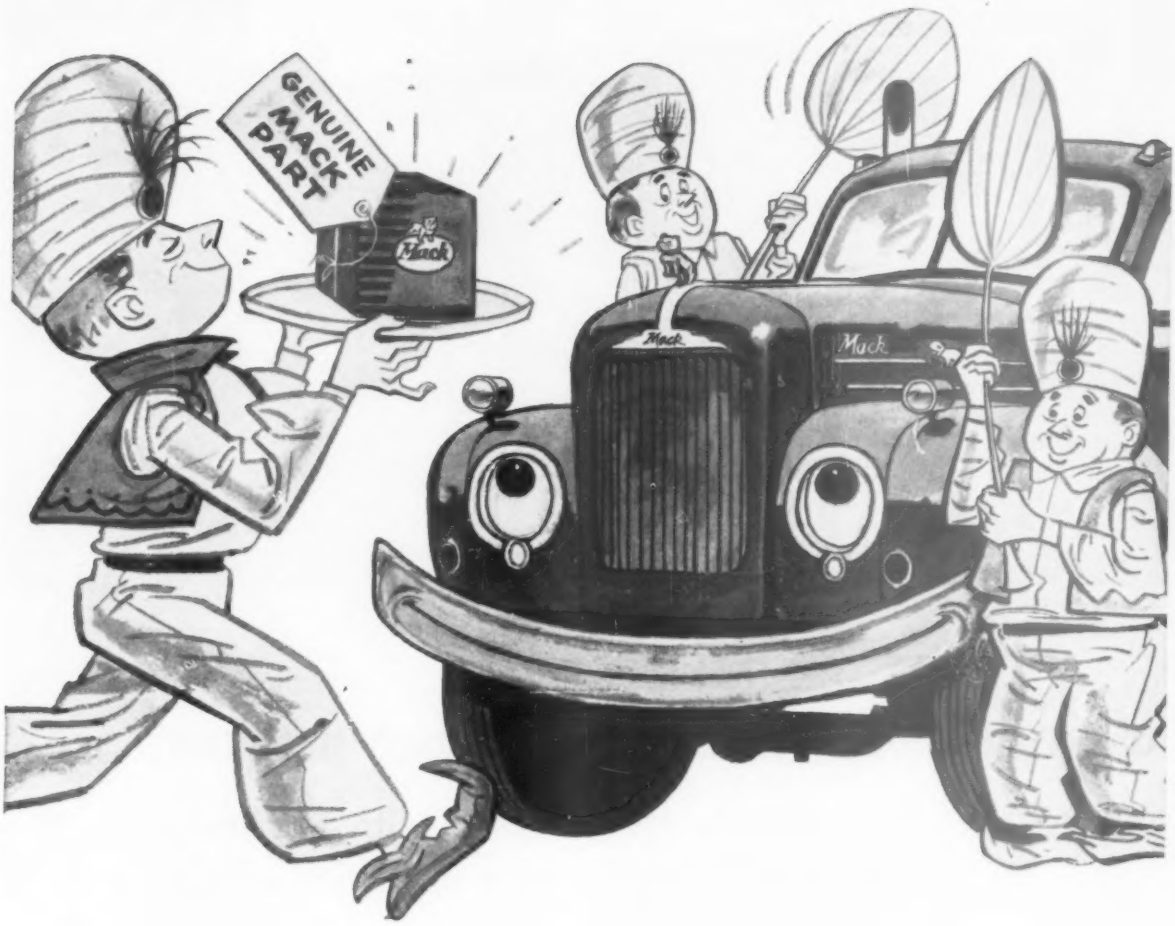

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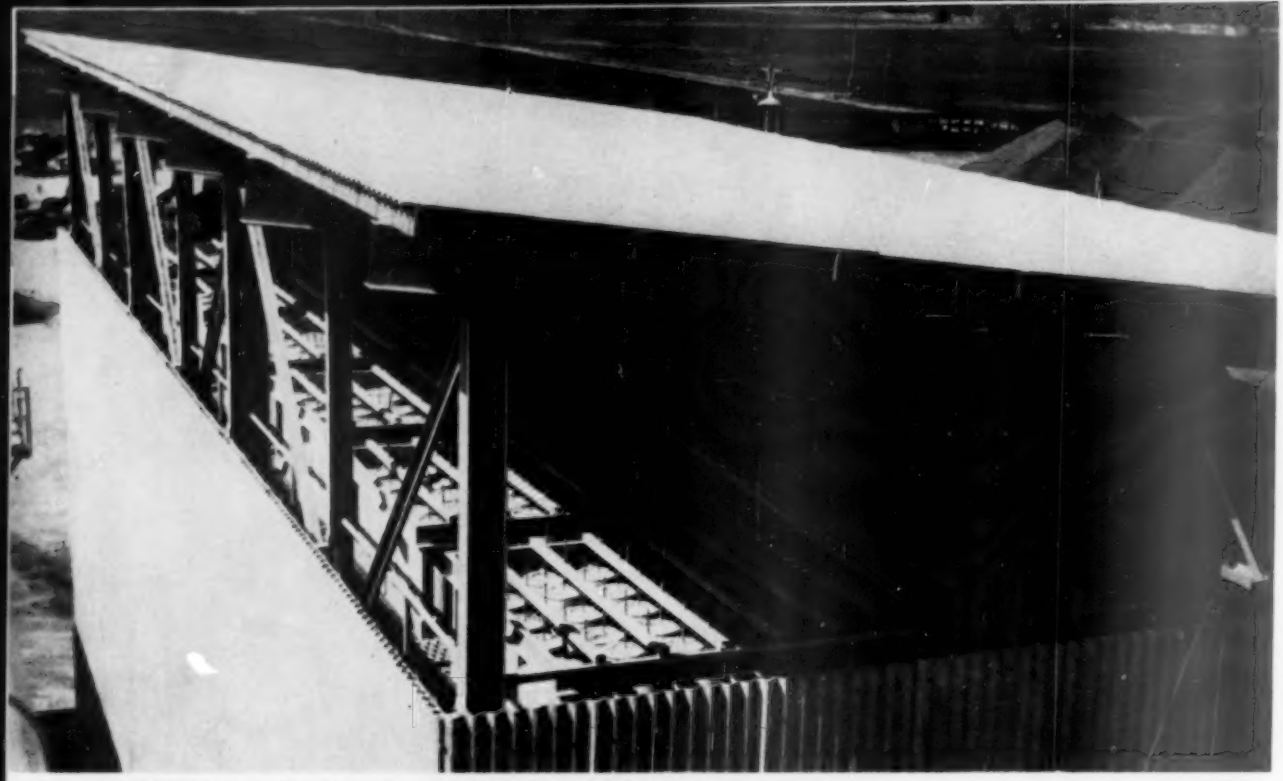


Cylindrical bags are housed in semi-enclosed structure adjacent to kiln

Glass bags: an answer to kiln dust problem

New silicone-treated bags withstand twice the heat of others, have ultra-high efficiency

THE USE OF GLASS BAGS for kiln-dust collection is being pioneered at Southwestern Portland Cement Company's El Paso, Texas, plant. The goal: 100 percent dust recovery.

In the cement industry, the basic problem was either to cool the hot kiln gases or to find a bag that could stand high temperatures. With the development of the woven glass bag and siliconizing of the glass fabric, the second alternative has been met: these bags are said to withstand temperatures of 550 deg. F. in continuous operation.

At least four makes of bags are being tested at El Paso and at another Southwestern Portland plant at Victorville, Calif. Baghouses as such are nothing new; they were used before World War I by Western copper and lead smelters to prevent air pollution and to collect valuable fume. But glass bags are clearly a new twist.

Here's how the system works: The bags are hung open-end down with the open end tied to a nipple that is part of a header. Dust-laden gases under slight pressure enter the bottom of the bag; dust is retained there. If the pressure is removed —by cutting off the source, by a vacuum or both —the inflated bag collapses.

In the old smelter baghouses, the bags were shaken from the top by automatic equipment. With the silicone-treated bag, the dust drops out of the unit when the pressure is removed; no shaking is necessary. General practice in the cement industry is to cut off the draft automatically every hour or oftener.

If the temperature is too low, moisture (wet process plants) may precipitate in the bag, forming a mud that can inhibit the flow of gases. However, it has been found that when bags are used to collect dust from wet-process kilns, any mud formed at the starting up of a cold kiln quickly dries out; when the pressure is removed, the bag cleans itself. Dust, then, may escape for possibly 20 min. during this warm-up period.

According to one bag manufacturer, some glass

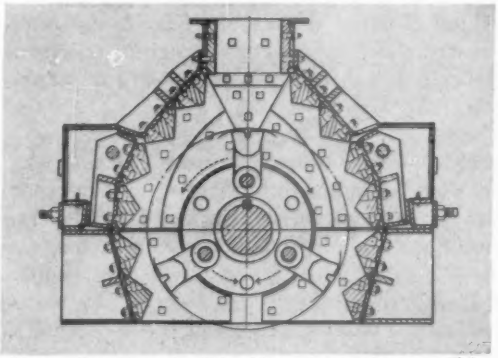
Please turn to page 121

WILLIAMS REVERSIBLE IMPACTOR

Up to 250 tons of aggregate hourly with only 6 men!

Illustrated is Williams No. 445-X Reversible Impactor powered by 250-HP motor. Preceded by a 30 x 42 jaw crusher and apron feeder, and followed by gradation screens in closed circuit, up to 250 tons of aggregate per hour was obtained to meet these Tennessee Highway Dept. specs.:

100	Percent	1"	Passing
80-95	Percent	¾"	Passing
50-85	Percent	⅜"	Passing
36-65	Percent	No. 4	Passing
20-43	Percent	No. 16	Passing
10-21	Percent	No. 100	Passing



Cross section of Impactor. Note wide gap between hammers. High drop chute feeds rock between hammers so it is thrown against impact blocks to set up a ricochet action. Center impact blocks are adjustable with relation to hammers.

The beaming smile on Clarence Duke, co-owner of Burns Stone Company of Burns, Tennessee, indicates his complete satisfaction with the amazing output of his Williams Reversible Impactor. Hitting the Tennessee Highway Department's tightest aggregate specification right down the middle on the "fine" side, the Williams Impactor produced an average of 200 tons-per-hour, frequently reaching *250 tons hourly with only 5 men and Mr. Duke*. Performance was so gratifying he ordered another Impactor for the Burns Company plant at Cumberland Furnace, Tenn. Ben Ferguson, at right, is representative for Southern Machinery Company, Williams' distributor for middle Tennessee and north Alabama, which designed and furnished equipment for the Burns' plants.

HIGHER OUTPUT of BETTER PRODUCTS at LOWER COST

- **100% product sizing** is assured with a Williams Impactor
- **Lower upkeep expense.** No close clearances of impact hammers and blocks have to be maintained.
- **Reversible rotor** doubles life of wearing parts. Eliminates manual turning of hammers.
- **Completely open discharge** allows unrestricted flow of finished material. Closed circuit operation takes out crushed material as fast as made. No over-crushing or grinding.
- **Accessibility-plus!** Easiest of all crushers to service. Complete rotor removable without disturbing any feed mechanism.
- **Heavy steel plate frame**—forged steel oversize rotor shaft—extra heavy alloy steel hammers and impact blocks—many other exclusives insure longer, lower-cost operation.

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Speakers on industrial minerals included C. E. Wuerpel of Marquette Cement, and Gordon Barr of Southwestern Portland Cement

AMC discusses blasting, glass filters

"Outstanding" is word for 1958 Mining Show

MOST OF THE SESSIONS at the 1958 Mining Show were aimed, as usual, at the metal miner. But the exhibit focused on rock products producers; these are the greatest users of the equipment giants shown and, by and large, the only ones who could afford them.

The exhibit, one of the largest ever staged, drew a huge attendance to the show, held September 22-25 at San Francisco's Civic Center Exhibit Hall and Civic Auditorium. Registration was said to be bigger than at any previous AMC convention; 3,500 delegates were at the opening session.

Some 180 exhibitors covered 115,000 sq. ft. of floor space with the latest equipment. Since the show was last held in San Francisco, in 1954, the city's Civic Center has been enlarged by the addition of an underground exhibit hall. With access from the surface provided by a wide concrete ramp, almost any piece of equipment that can travel the highways could be exhibited. Giant specimens of the manufacturer's art and off-the-highway units overflowed into the yard.

About 100 speakers—including Secretary of the Interior Fred A. Seaton, Governor Goodwin J. Knight and Senator William F. Knowland—took to the rostrum in four days of concurrent sessions. One half-day session was devoted solely to industrial minerals.

Highlight of the session on open-pit mining was a symposium on ammonium nitrate blasting that was also of interest to rock products producers. "Although ammonium nitrate has been used as an ingredient for explosives for many years, it is only during the past few years that the technology has advanced to the point of producing a low-cost high explosive in its bulk form," Frank Quilici said during this discussion. Mr. Quilici is pit superintendent of the Nevada Mines Division of Kennecott Copper Corp.

H. E. Farnam, Jr., manager of operations, Iron Ore Co. of Canada, said his company has gradually switched to about 80 percent fertilizer-grade am-

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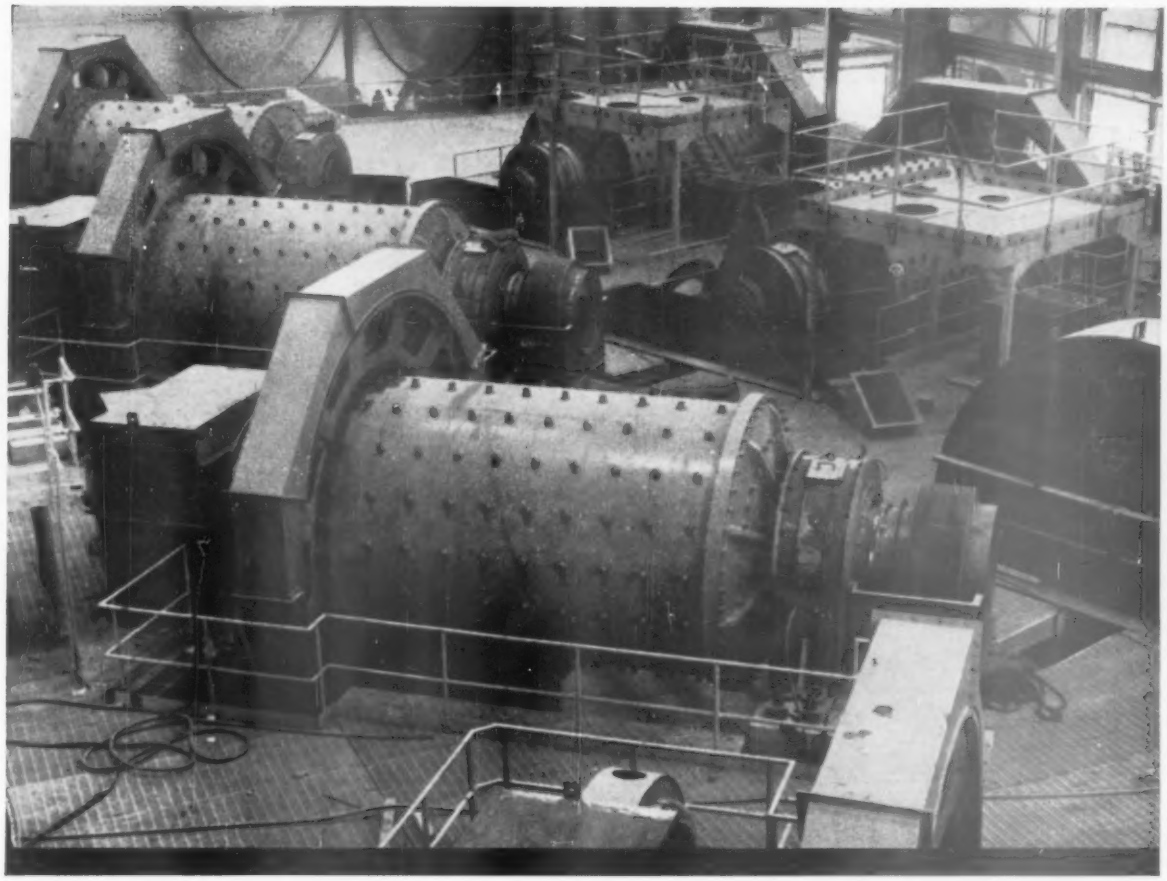

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- Cast steel or Meehanite heads
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Exhibits focused on rock producers—the greatest users of equipment giants shown

monium nitrate for its blasting requirements. He said that during the past seven months, the company has used 5.2 million lb. of the explosive.

Starting in 1956, the company began developing an explosive agent which would be compatible with water and would be more powerful than an ammonium nitrate-water mixture. Mr. Farnam said that after two years of development work, the company now has explosives which can be handled in bulk, which are water compatible and which have excellent power characteristics. He reported that in the process of developing these explosives the company also came up with an inexpensive primer for use in conjunction with the ammonium-nitrate explosives.

"Our adoption of the use of ammonium nitrate as an explosive was prompted primarily by two considerations—the problem of safety and the question of cost," James Hyslop, president, Hanna Coal Co., Cadiz, Ohio, told the group. In adopting ammonium nitrate, the company ran into two major problems, he said. The explosive was erratic and required the use of some type of sensitive high explosive as a primer. After considerable experimentation by the company, both these problems were solved.

Lewis J. Patterson, manager of the Northern District, Michigan Limestone Div., United States Steel Corp., said that "the benefits derived from the use of nitrate and its associated compounds in blasting limestone have been substantial." One reason, he said, has been the free exchange of technical information among the people in the quarrying and mining business.

Other papers delivered at this session touched on large-diameter blast-hole practice, a skip-hoist and truck transportation system and drilling and blasting of taconite iron ores. Subjects of joint interest to metal miners and rock products producers—safety and health, research and education, management problems, labor relations—were dealt with at other sessions. Additional meetings of related interest to the nonmetallic minerals industry included the one on milling and metallurgy, which featured some of the latest trends in fine grinding, automation, flow of crushed material and plant design.

The outstanding success of the Mining Show as a whole can be traced to several factors. First, the technical and industrial press and the newspapers were literally flooded with news releases from the AMC's press service. In many cases, the full text of a speech was available in the press room. Abstracts of talks were also available.

Second, the services of a very large number of important men in all branches of the mining industry were utilized in convention committees. And finally, some 80 exhibitors threw open hospitality rooms in San Francisco's many hotels; these were listed in the official program.

Here are summaries of papers of interest to rock products producers:

—Pioneering work in two Texas cement plants indicates that spun glass and other fabrics can be used successfully to filter solids from rotary-kiln gases. Gordon W. Barr, Southwestern Portland Cement Co., told of the company's experience with fabric bags at a wet-process plant at Victorville and a dry-process plant at El Paso.

—C. M. Gilliss, California's director of public works, estimated that the state's raw material requirements under the Federal road program for the 1959-60 fiscal year will look like this:

Untreated rock base .....4.6 million tons
Asphaltic mixes .....5.9 million tons
Portland cement .....3.8 million bbl.

These needs, he pointed out, represent 3.1 percent, 10.5 percent and 4.8 percent of the total budget.

—J. C. Hicks, Director of Research, Kaiser Aluminum and Chemical Co., spoke on the use of industrial minerals in basic refractories. Sources, methods of preparing and chemical properties of refractory chromites, magnesites, dolomites and other minerals were discussed. Mr. Hicks also outlined future requirements and trends.

—Results of the underground contained nuclear explosion experiment conducted at the Nevada Test Site of the Atomic Energy Commission on September 17, 1957, were described by Gerald W. Johnson of the University of California's radia-

Please turn to page 119

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Speed Sand and Gravel Removal With Bucyrus-Erie Dependability

Bucyrus-Erie dependability is helping to lower costs in sand and gravel plants all over the country. A few of these operations are shown here. The machines on these jobs are built tough. Parts are large, strong, few in number — there is little that can go wrong. Machinery is arranged simply, compactly to provide strength, durability and stamina. Look over the sand and gravel jobs pictured here. Then ask your Bucyrus-Erie distributor about the many economy features of the Bucyrus-Erie ⅜ to 4-cu. yd. line of excavators. Do it today. 463E58C

This 88-B strips overburden at a gravel pit south of Dallas, Tex. "Our 88-B is doing a very good job," says the project superintendent. "It's just what we needed for this location." The owners of the 88-B, who operate three gravel plants in the Dallas area, benefit from its fast, easy handling and from the lack of mechanical trouble.

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

A 71-B loads sand and gravel for highway construction in New York state. The job, consisting of close to a million yards of material, is located on Long Island. Here, as on scores of construction projects from coast to coast, Bucyrus-Erie dependability pays off.

A sizable base course crew and an entire rock plant operation depend on this 38-B shovel to dig continuously without breakdowns. It is not disappointing its owners, who praise it for its dependability. The 38-B is working in Texas.

"We own four 15-B draglines and consider them the very best buy on the market," says the satisfied owner of the 15-B shown here. This machine loads pit gravel for rural road maintenance in Alabama. In this wet pit operation, the dragline excavates a staked-out 6-acre area to a depth of 6 feet.

A Bucyrus-Erie 54-B dragline teams up with a 51-B (in background) to excavate river floor overburden and pit run gravel. The material from this pit supplies a commercial gravel plant northeast of Ft. Worth, Tex. The steady operation of these machines is important because the company's six plants depend on them for a continuous supply of sand and gravel.

Main processing tower has scrubber, screens, crushers (lower right) and sand screw (hidden at left)

Small plant used as core for big one

Careful planning means present equipment can be used

When Curtis Construction Co. secured the contract for the first 200,000 cu. yd. of aggregate of the million that will be used in Washington's $250 million Rocky Reach dam on the Columbia River, the Spokane firm built a simple, compact plant to meet the modest needs of the moment. Then, getting the go-ahead for a larger slice of the dam's aggregate needs, the company rebuilt its plant to raise tonnage potential from 160 to 425 tph.

The revamped plant was built around the first one, keeping the same basic pattern. In building both plants, Curtis took advantage of experience gained producing sand and gravel for two other big power projects—The Dalles dam, also on the Columbia, and the Ice Harbor project, on the Snake River.

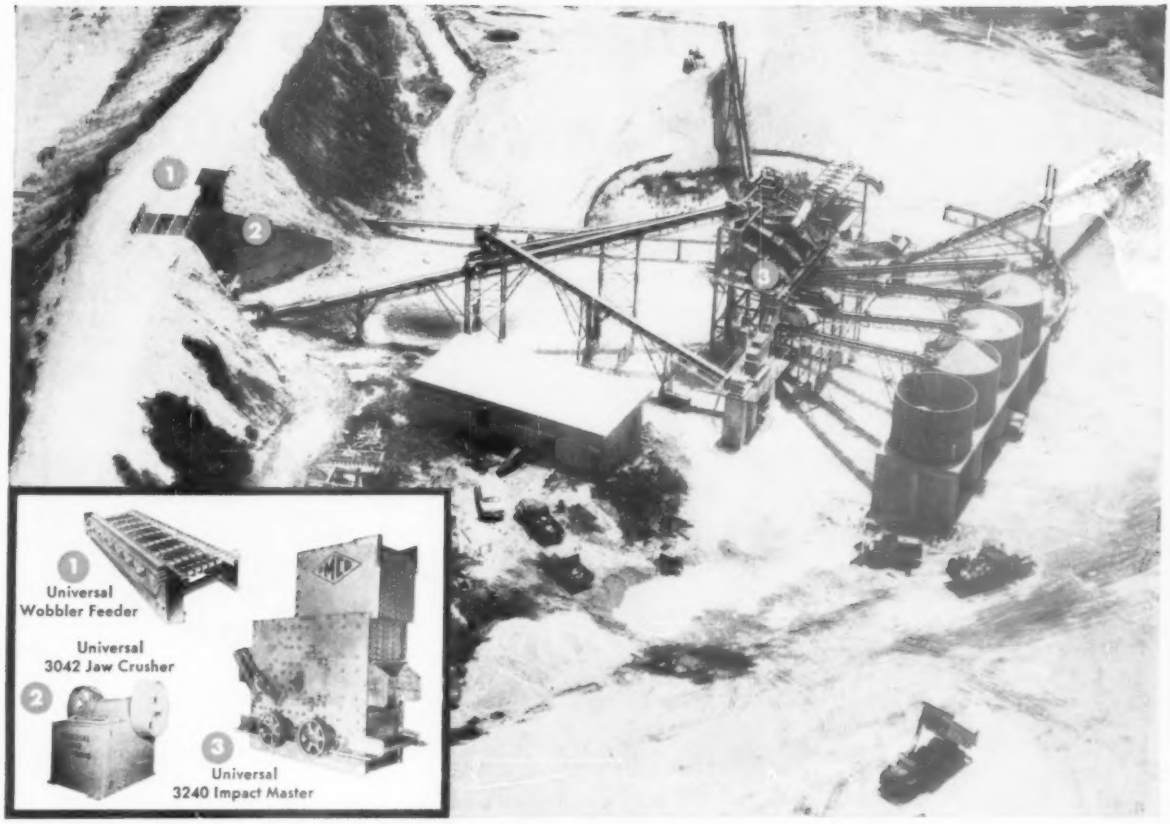
The Rocky Reach dam will turn the rushing waters of the Columbia into useful power for the rich Wenatchee valley. Compared with the Grand Coulee or Chief Joseph dams above it on the river, Rocky Reach is not a high dam. The main dam concrete structure will have an average height of 127 ft. above bedrock, and will involve 910,000 cu. yd. of concrete. Initial power output will be 775,000 kw. with ultimate capacity of 1,200,000 kw.

The project is being built by the Chelan County Public Utility District and is scheduled for completion in 1962. The Chelan County PUD also owns the Rock Island dam on the Columbia River a few miles downstream from Wenatchee.

The aggregates follow typical U. S. Army Corps of Engineers specifications. The company turns out four sizes of coarse aggregates—6 x 3 in.; 3 x 1½ in.; 1½ x ¾ in. and ¾ x No. 4—and one grade of concrete sand.

A large tonnage of sand and gravel is obtained out of the excavations for the cut-off section and portions of the dam site. This material is piled on the east bank of the river adjacent to the site, and Curtis Construction built both its plants near

Please turn to page 113



"Universal equipment is the backbone of this new 'show place' aggregate plant"

says Saunders A. Dukes, general superintendent of the R. H. Wright & Son plant, Fort Lauderdale, Florida

"This plant was built to provide a high hourly turnout of specification stone with the most economical use of men and machinery possible.

"The crushing and feeding components, bought from Universal, were selected after careful comparison of all available machines. The result is a well integrated, highly efficient plant which can crush, screen, wash and deliver 400 tons of material per hour.

"We're working with porous, coral limestone mined from water by dragline. First, the stone is passed over our 9" Universal Wobbler Feeder set at an uphill incline of 7° to hold back material for thorough separation. We use a variable speed drive with 15 HP. The bars of the feeder bed are set in alternate vertical and horizontal positions and spaced 3½" apart.

"Presently, we dump 225 tons per hour onto the feeder bed. As the bars rotate the load is carried forward. Oversize is fed into our primary crusher, a Universal 3042 jaw crusher. Material 3½" and under sifts through the Wobbler bar openings and joins the material from the jaw crusher on a belt conveyor leading to a primary screening tower. Here the load is divided between two 3-deck, 5' and 14' screens. Oversize from the screens goes to our 150 HP Universal 3240 Impact Master for secondary reduction.

"The entire operation is electric and can be operated by one man from a central location.

"No general maintenance has been required on the Wobbler Feeder or the 3042 jaw crusher."

Here is powerful evidence of Universal's equipment superiority. Mr. Dukes chose Universal as the backbone of his plant because its efficient performance economically produced the large quantities of specification stone required.

Universal equipment will do the job as well for you. Just tell us the material you're working with and your requirements. Our engineers will study your operation and show you how Universal equipment, alone or in combination, can give you dependable, economical production. Address your requests to:

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That is, if they are Seco Twin-Bearing screens. Yes, actual results, reported to us by producers themselves, give strong proof that SECO design and engineering superiority really pay off . . . day after day, year after year where it counts . . . on the job. Today, with your own profits so dependent on operational efficiency, we believe it will pay you to get the full information about SECO Twin-Bearing screens.

"Over 1,000,000 tons without a whimper from our SECO Twin-Bearing Screens" reports Jules Koczat of Buffalo Crushed Stone Corporation. "We've screened eight sizes of aggregate for 1½ years without a minute of downtime. We are so pleased we now have seven SECO Twin-Bearing screens on the job."

"We like the action and performance of this screen."
Joe Schwendt, Sup't.
Amico Sand & Gravel Co.
Riverside, N.Y.

"This screen is a real screener. Elmer is very happy with it, and says they will be ordering more of them in a month or so."
R. P. Fulton
Southern Machinery & Supply Co.
Roanoke, Va.

"This sieve analysis is a real endorsement for your TWIN-BEARING screens."
K. K. Kagarise,
General Sup't.
The Standard Slag Co.
Youngstown, Ohio

"Our TWIN-BEARING screens are doing a real good job of screening. Our only replacement has been screen cloth."
Paul Padgett,
Purchasing Agent
Thompson, Weinman & Company
Sylacauga, Alabama

"I Never believed a two-bearing screen could perform like this' We're averaging 120 TPH in three sizes of gravel plus concrete sand . . . with no trouble at all on our 3 x 10 Triple Deck model."
Eric A. Krehbiel
President Clarence Sand and Gravel Corp.
Clarence, New York

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Single, double, triple and half deck variations. May be suspension or base mounted.

RIGID BOX FRAME CONSTRUCTION

Eliminates body distortion thus preventing undue stress on shaft assembly.

20%-30% HEAVIER AND STRONGER SHAFT

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SCREEN EQUIPMENT CO., INC. **BUFFALO 25, N. Y.**

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The $250 million dam uses 910,000 cu. yd. of concrete

Core plant grows

continued from page 110

this stockpile. The material is pushed to the feed hopper over the primary crushing section by tractor and dozer.

The flow of material through the first plant was quite simple: First it passed from a feeder to a 20 x 36-in. jaw crusher. From there an inclined belt took it to the 4 x 26-ft. rotary scrubber-screen with an end section of 6-in. openings. Under this section was a three-deck 5 x 12-ft. wet screen, the second deck serving to protect the sand screen below it. The top deck of this screen prepared the 6 x 3-in. washed cobbles. Oversize from the end of the rotary scrubber-screen fell to two 10 x 36-in. jaw crushers mounted back-to-back and receiving a split feed. Through material from these crushers was conveyed back to the No. 1 belt conveyor serving the plant.

Intermediate material (minus 3-in. x plus No. 4) was taken to a 4 x 12-ft. three-deck wet screen that prepared the other three sizes of gravel. Plus material from the top deck of this screen was recycled to the secondary crushers.

The larger plant became necessary when other sand and gravel contracts were obtained by the Curtis Company. When the new plant was built around the old one, a 5 x 24-ft. rotary washer screen was used as the backbone. The primary crusher was moved farther into the spoils area; a surge pile of primary through material now occupies the older location of the primary crusher, and an electric vibrating feeder is under the surge pile.

Both vibrating screens were replaced by new and larger units. The three-deck screen tucked

Unusual radial stacker is supported by A-frame, wire rope

under the end of the rotary scrubber-screen is now a 6 x 16-ft. unit; the final vibrator is also a 6 x 16-ft. unit but has only two decks.

A 3-ft. standard cone crusher has been installed alongside the 10 x 36-in. crushers, and these three secondary crushers receive a split feed from the end discharge of the rotary scrubber-screen as well as any unwanted 3 x 1½ in. or 1½ x ¾ in. Crushed rock is conveyed back to the top deck of the first vibrating screen instead of going back through the rotary scrubber-screen.

Please turn to page 122

MAJOR EQUIPMENT USED BY CURTIS CONSTRUCTION CO.

Tractor, D-8 and dozer	Caterpillar Tractor Co.
Crusher, primary, #2036	Universal Engineering Corp.
Crusher, secondary, (2) #1036	Pioneer Engineering, Div. of Poor & Co.
Crusher, standard 3-ft. cone	Nordberg Mfg. Co.
Vibrating screens (2)	Simplicity Engineering Co.
Rinse screen	Pioneer Engineering, Div. of Poor & Co.
Vibrating feeders	Syntron Co. Jeffrey Mfg. Co.
Trucks	White Motor Truck Corp.
Sand screws, twin, 30 in.	Eagle Iron Works
Sand preparation machine, 36 in.	Western Machinery Co.

Flocculation *continued from page 83*

a ½ percent dispersion of Arquad 2HT. Once adequate mixing of the Arquad was obtained, the material was allowed to settle.

The results of these laboratory tests indicate:

1. That .2 parts per million of Arquad 2HT can be substituted for 20 ppm. of alum as a pre-flocculant with NP-10, Aerofloc 3000, etc.

2. By increasing the concentration of Arquad 2HT to about .5 ppm., the same degree of rapidity of flocculation occurred as with 20 ppm. of alum and .5 ppm. of NP-10.

3. In both of the above cases, settling took place at a rate comparable with that of conventional methods.

4. The settled material contained a significant amount of water, although no quantitative analysis was made of the water content.

Crown Zellerbach Corporation's Chemical Products Division produces Orzan P and Orzan PL-40, which have found some use as flocculants.

The trade name Orzan covers a family of products derived from the pulping of wood by the ammonia-base process. Orzan A, containing ammonium lignosulfonates, and Orzan S, containing sodium lignosulfonates, are basic members. An important new member of the family is Orzan P and its liquid counterpart, Orzan PL-40.

Orzan P and PL-40 differ from each other in physical form only—Orzan P is a spray-dried powder and Orzan PL-40 is a water solution containing 40 percent Orzan P solids. Chemically their reactions are practically identical. Orzan P has one special property which sets it apart from Orzan A and Orzan S: it may be precipitated, even from dilute solutions, by the addition of alum.

NP-10 is a flocculating agent prepared by the Dow Chemical Co. that is receiving considerable attention in rock products and metallurgical operations. It is a synthetic, organic, water-soluble, high-molecular-weight polymer. It is shipped as a white amorphous solid that is dissolved and applied as a dilute aqueous solution. NP-10 is effective on most solids. Good flocculation is readily obtained in solutions ranging from strong acid to strong base, regardless of salt content. Normal consumption for increasing settling rates ranges from .01 to .10 lb. per ton of solids. Larger amounts do not cause redispersion.

In one settling operation, NP-10 at a concentration of .1 lb. per ton of dry solids increased the settling rate more than 40 times. In actual practice, although the cost of this high performance was not prohibitive, the operation was better integrated with other portions of the process when a dosage of .04 lb. per ton of dry solids was used. This resulted in a settling rate three to four times that of untreated pulp.

Prior to use, NP-10 should be prepared as a 1 or 1.5 percent solution in water. This solution may be prepared as needed or stored for periods up to one or two months. No heat is required. To flocculate pulps before settling, it is recommended that the 1.5 percent solution be diluted to a .04-.10 percent (.4-1.0 grams per liter) solution prior to application. The optimum concentration of reagent depends to a large extent on the solids content of the pulp or slurry. In general, the thicker pulps require a more dilute reagent. The 1.5 percent stock reagent may be diluted with fresh water or with any aqueous solution, such as recycle overflow, that is substantially free of flocculatable solids. In general, the more dilute the solution, the lower the amount of flocculant needed to accomplish the desired result.

The best way to make the stock solution is to add the dry material to water while the latter is being well agitated by a power mixer. The powder should be fed uniformly into the vortex in 5 to 10 min. to avoid formation of balls or lumps. It has been found convenient to feed the chemical by means of a vibratory feeder. The reagent can also be powdered into the vortex with a scoop or shovel. Continuation of agitation for a period of two hours is usually sufficient to complete the dissolution. A 1.5 percent solution with a pH of between 5 and 9 is stable for several months and requires no preservative. Highly alkaline solutions gradually degrade the reagent.

In order to obtain the best possible mixing, it is recommended that the dilute NP-10 solution be added at three points to the stream of flowing pulp containing the solids to be flocculated. The objective of this procedure is to prevent local overtreatment, since reagent absorbed by solids in excess of that necessary for flocculation does not redistribute to untreated solids. Rake action is generally advantageous, but violent agitation such as that accomplished by the use of centrifugal pumps will probably degrade the flocs.

Material that has been flocculated and subsequently redispersed by violent agitation can be re-flocculated by the addition of further amounts of NP-10. The amount that is required for the second flocculation depends on the degree of floc destruction, but it will be less than for the original treatment.

NP-10 presents no particular toxic problem. The amount used in a suspension is normally so small that domestic water is not impaired. The chemical sells for a few cents more than $1 per pound, depending on the amounts purchased.

E. I. du Pont de Nemours & Co. makes a floccu-

Please turn to page 116

MAGNECON*

meets the needs for hot zone linings

The refractory lining of rotary cement kilns must pick up and hold a sound coating. Whatever your burning temperature, silica ratio, frequency of mix changes or shutdowns, uniformity or otherwise of kiln feed analysis and load — the soundness of the protective coating on the hot zone lining is a vital factor in your production and operating economy.

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Flocculation *continued from page 114*

lant called EXR-102A. Laboratory flocculation tests on a dispersed bentonite and on a phosphate slime produced the following results:

	Bentonite	Phosphate Slimes
Solids (grams per liter)	100.0	3.4
pH	6.6	7.1
Settling time (min.)	20.0	10.0
Unsettled solids (percent)		
—Without flocculant	28.0	23.3
—With flocculant	2.5	2.6

Guartec is a flocculating material that is being exploited by the Special Commodities Division of General Mills, Inc. The chemical is a guar gum and a hydrophilic colloid. It is derived from the "Guar bean" grown in Pakistan, India and the southwestern United States.

Guartec is a powdered material; when added to water, it forms a "sol." Due to the material's unique properties, it has several uses in the rock products industry—for example, as a depressant in flotation and as a filtration aid. It is non-toxic and functions properly in a rather wide pH range.

END

NSGA meet *continued from page 102*

would be mailed soon. Stanton Walker then reported to the joint group on the present research facilities, the fellowship program at University of Maryland and the status of the Short Courses of Instruction. The latter has been so successful that it has been necessary to set up four courses, one each month from October through January, 1959. This procedure has the approval of the University of Maryland, where courses are held.

The joint group insurance plan and the retirement program are meeting with good acceptance among members of both groups. The Group Insurance Plan now serves 80 member companies and the association's staff. Companies participating in 1958 have insured employes and dependents, according to Herbert G. Jahncke, to the tune of $57 million in life, accidental death, and in hospital, surgical and medical protection. Growth of the plan has been so rapid that the joint board increased the Board of Trustees for the Plan from seven to eleven members. New Trustees elected are Charles E. Brady, Henry H. Kirwin, Lester Prange, and M. Eugene Sundt.

The Retirement Program progress report was given by Donald Shepherd, whose company is benefit plan consultant for the two associations. More than 100 companies have expressed interest in the program since its adoption in October, 1957. A total of 42 companies have adopted or are in

Please turn to page 118

Genuine Blaw-Knox repair parts are the best way to extend service life

Your Blaw-Knox Clamshell Bucket was designed and built as a complete unit to give you the most efficient operation, low maintenance and long life.

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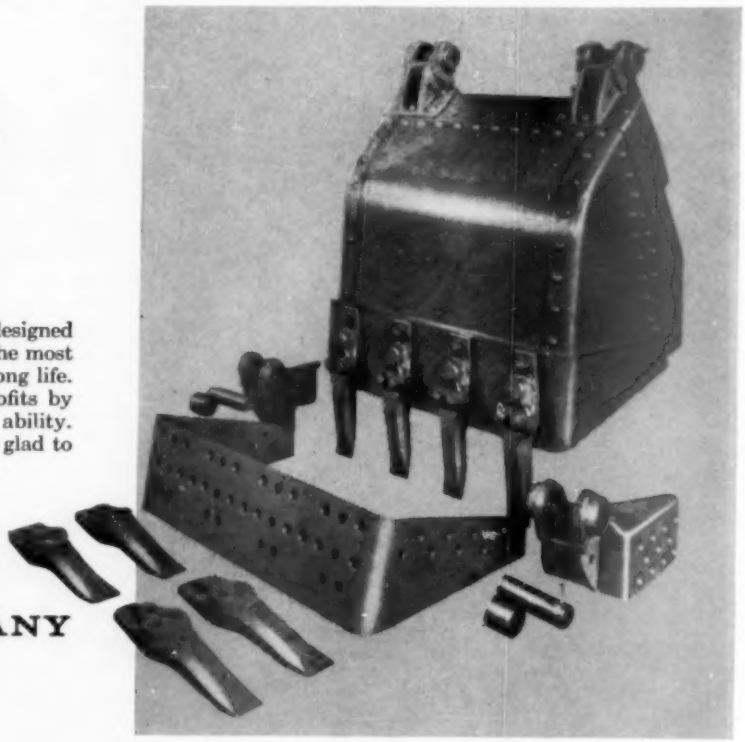

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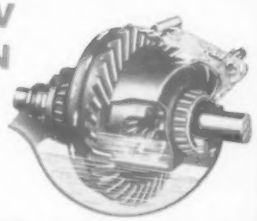

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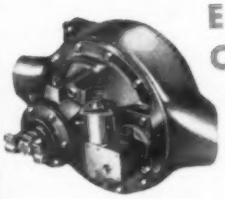

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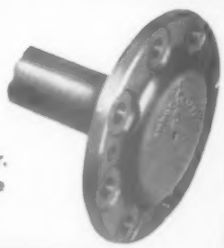

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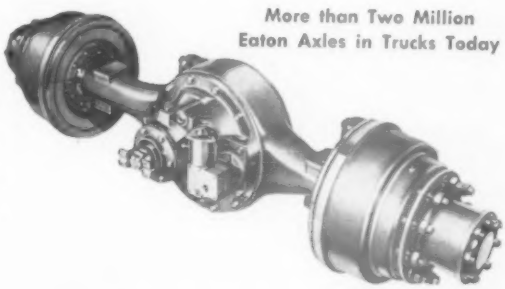

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NSGA meet *continued from page 116*

the process of considering the adoption of the plan.

Two members were elected to serve terms of three years each on the Retirement Plan Committee. They are Mr. Fred P. Curtis, representing the NSGA, and Mr. F. E. Schouweiler representing NRMCA.

Taxes probably will be increased on trucks and gasoline, according to Mr. Ahearn. In his report on the current status of the Interstate Highway Program, he warned that the Highway Trust Fund may show a deficit of $850 million at the end of fiscal 1960 unless more money is made available to the Fund or its scope is reduced. Congress is sold on the road program, so no cutback is in sight and since no transfer to the Fund from the general fund (already a $12 billion deficit) is probable, it looks like increased tax levies will be necessary to keep the Fund in the black.

In other sections of his report, Mr. Ahearn mentioned that one should shed no tear over failure of the Kennedy-Ives bill to pass Congress. It was an inadequate bill, since it tried to please everyone. The Douglas Bill, regulating the operation of welfare funds, also was classed as inadequate by the President.

The price of labor peace has been high in 1958, for there has been a plague of bad strikes. It was suggested that some contracts signed by some producers are little short of shameful, going far beyond the concept of good business practice.

The joint group discussed the program arrangements for the 1959 meeting in New Orleans, La., during February. **END**

Blasting agent *continued from page 71*

percent of the total, have been removed to make the N-IV type 100 percent ammonium nitrate by weight. This means that a blast hole requiring 200 lb. of the former material may be blasted by 192 lb. of the new material with equal results.

(3) N-IV is shipped in waterproof plastic bags. Such bags are believed to eliminate storage problems, simplify mixing, and provide for cleaner and easier handling.

No comparative data are available from Calaveras Cement Company, since the blast in September—using N-IV—was the first one tried on the property. If all claims prove to be true, considerable savings could accrue to Calaveras with use of the new material, since the company blasts more than 1¼ million tons of stone annually. Including stripping, the company moves more than 3 million tons a year. **END**

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Available as ⅛, 5/32, and ¼-inch diameter electrodes (DC), in 10-pound metal containers.

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Mining show *continued from page 108*

tion laboratory. The device was detonated at a depth of 900 ft. in a 6 x 6 x 7-ft. room in a thick deposit of sedimentary rock and sand saturated with water. On explosion, the roof collapsed and caving proceeded successively up to 400 ft. above the point of detonation. The room was expanded to a roughly spherical shape with a radius of 55 ft. This cavity was lined with a layer of melted rock, at a temperature of 1200-1500 deg. C., which then cooled to form a glass. The tunnel collapsed within a radius of 200 ft. from zero site and heavy breakage of walls was noted up to about 400 ft. The ground shock was not felt by observers beyond two and one-half miles.

Possible applications of nuclear energy to the mining industry were discussed by David D. Rabb, also of the university's radiation laboratory.

Mr. Rabb said energy from a nuclear explosion can be distributed underground in two directions along a tunnel, in four directions along two intersecting tunnels of limited length or equally throughout a large flat cylinder. This makes it possible to direct the force of an explosion over a desired area.

The speaker said nuclear explosions could be used to remove overburden or waste material from underlying commercially valuable ore and for breaking up large ore bodies preparatory to drawing off the crushed ore. The intense shock plus the heat and pressure provided by an atomic or nuclear device could be used to promote recovery of petroleum products from tar sands, oil shales, gas-bearing strata and depleted or heavy oil fields.

In the more arid areas, Mr. Rabb said, an underground cistern might be developed. The application of nuclear power to quarrying and the production of fill or rip-rap is a "natural," he said. He also pointed out that underground explosions create a huge, hot cavity in which steam may be created to run generators for the production of electricity.

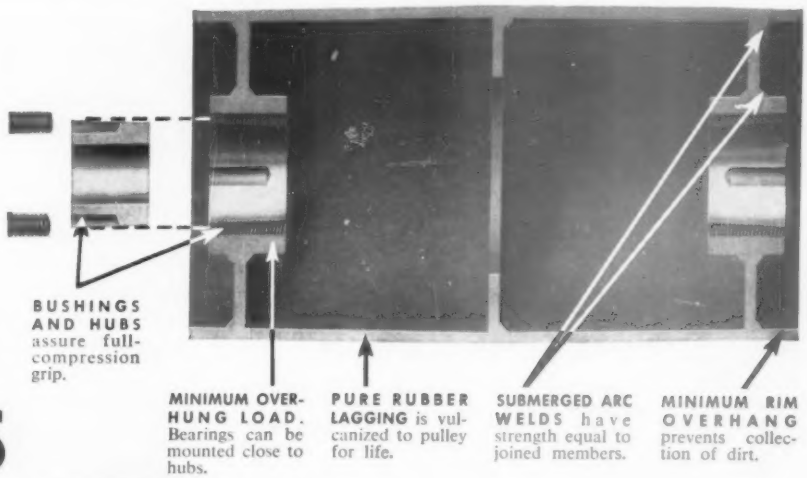
—R. T. Lassiter, Western-Knapp Engineering Co., outlined recent trends in plant design, including the use of closed-circuit TV cameras, automation and graphic and semi-graphic panels for better plant control. One-man plant control, the speaker said, is a definite trend. Mr. Lassiter drew on his company's design and construction experience in the rock products industries to illustrate his points.

—J. F. Corkill, Pacific Coast Borax Division, U. S. Borax & Chemical Corp., said that while it took the boron industry 100 years to reach a production of a million tons per year, the use of boron

Please turn to page 120

These features make LINK-BELT welded steel pulleys . . .

BEST FOR YOUR BELT CONVEYORS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Taper lock bushings . . . all-steel construction . . . exact alignment — features like these make easy-mounting Link-Belt welded steel pulleys best for your belt conveyors. They're available from 6- to 60-in. diameters, 12- to 66-in. faces with bushings for 15/16- to 10-in. shafts. Immediate delivery in every industrial area from your Link-Belt factory branch store or authorized stock-carrying distributor.

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EASY OFF . . . Remove screws, screw one into hole with half-threads in bushing. With bushing released, shaft can easily be slipped off pulley.

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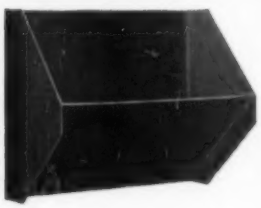
STANDARD METAL'S CONTINUOUS ELEVATOR BUCKET STYLE No. 2



Provides outstanding service and economy under severe operating conditions. It resists wear—assures longer bucket life. This style of bucket is just one of the complete line of low-cost, rugged steel buckets manufactured by Standard Metal. Available in Salem, Style "A" and other continuous style buckets.

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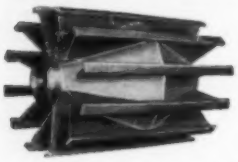

These pulleys provide six cost-cutting advantages—all-steel welded construction . . . lower cost . . . less weight . . . greater strength . . . greater resistance to breaking . . . longer life.

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Write today for complete details and quotations on your needs in elevating and conveying equipment. We also will send you the catalog showing the complete Standard line. SM6

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Mining show *continued from page 119*

as a fuel may double the requirements within the next ten years. Deposits in California are supplying the requirements of the United States and 90 to 95 percent of the free world. Mr. Corkill said that to keep 30 bombers flying one year, using boron fuel and flying only 25 percent of the time, would take about 45 percent of the current American borate production.

—Ventilation of an underground mine at Butte, Mont., was described by John W. Warren, Anaconda Co. Mr. Warren said air-conditioning units range in size from 25,000 cu. ft. per min. to 70,000 cu. ft. per min. He said the large plant is capable of delivering 2,500 tons of refrigeration per day.

—Asbestos mining under a Canadian lake was described by Victor I. Mann, vice president, Lake Asbestos of Quebec, Ltd. Lake Asbestos is a wholly owned subsidiary of American Smelting & Refining Co. To get at the ore bodies, it was necessary to lower the level of the lake by retarding the natural flow of rivers and creeks into it. Dredges also assisted in lowering the lake level and exposing the ore.

The mine was prepared for production by the removal of over 26 million cu. yd. of waste material by dredging and nearly 6 million cu. yd. with shovels and trucks. A modern asbestos milling plant with a capacity of 4,000-5,000 tons per day has been constructed. The plant started production July 1, 1958.

—Floyd W. Erickson, Reserve Mining Co., told of the drilling of blast holes in taconite iron ore in Minnesota with the jet-piercing process. A 6¼-in.-diam. hole could be burned at a rate of 35 fph. Regular drills penetrated at 1 fph. and had to be replaced every 20 in. of drilling. The area contains 1½ billion tons of 24.19 percent magnetic iron, the speaker said.

—"Large Diameter Blast Hole Drilling and Blasting" was discussed by John A. Lentz, Jr., general superintendent of Phelps Dodge Corporation's Morenci, Ariz., branch. He said that drilling and blasting experience in the Morenci open-pit mine has demonstrated that, in rock which fragments well, 12-in.-diam. blast holes offer marked advantages over 9-in. holes.

—The use of a combination of an inclined skip and trucks in open-pit mining operations in Arizona was described by E. C. Spaulding of Tucson. Mr. Spaulding said that preliminary estimates indicated that operating costs for a complete truck-haulage system from the pit to the primary crusher would have been 24 cents per ton of material. It was estimated that the cost of a combination truck and skip system would be slightly over 16 cents per ton. **END**

Glass bags *continued from page 104*

bags will stand temperatures as high as 1,000 deg. F. for a very short period of time. As a comparison with what other types of fabric can take, the following figures have been reported:

Cotton ....180 deg. F.	Nylon ....200 deg. F.
Wool 210	Orlon 250
Dacron ...275	Glass 550

Silicones are said to decompose at a sustained temperature of 600 deg. F.; glass, at 725 deg. F. However, higher temperatures have been sustained for close to an hour without serious damage. The initial cost of glass and silicone bags depends on their weight, but in general is comparable with wool, nylon and filament orlon.

The woven glass fabric from which the bags are made is usually delivered to the bag manufacturer in bolts of various widths and in a great variety of weaves and weights. If the final bag is to be siliconized, it is done before the bag is sewn. The silicone treatment is said to prevent dust from clinging to the bag's surface. Bags are sewn to any length and diameter with glass thread. Glass fabric ropes are provided.

The El Paso plant has three 10 x 8 x 150-ft. kilns with waste heat boilers and electrical precipitators and one 9 x 150-ft. kiln with a multiclone, too. The raw mix in this dry-process plant is thoroughly mixed by special aeration tanks to achieve a uniform blend. Natural gas is the fuel.

At the outset, two kilns were equipped with 792 glass bags each. One kiln used bags 16 ft. long; the other, 20 ft. long. All were 6 in. diam. and were collapsed at 5-min. intervals. These first bags went into service more than a year ago.

Replacement of damaged bags in both installations averaged about one a day, but after a method of patching with an adhesive was evolved, damaged bags could be reused. Point of maximum damage was at the nipple connection.

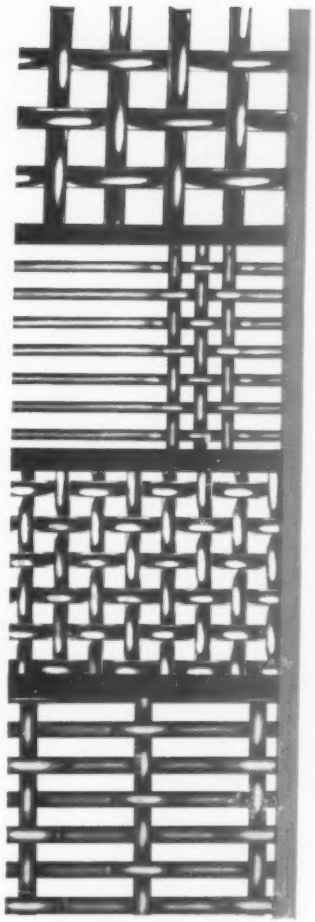
In a newer installation, bags 11½ in. diam. and 20 ft. long are housed in a baghouse. There are 430 bags with a capacity of 35,000-40,000 cfm. Tempering air can be admitted to the system automatically. A signal horn sounds an alarm if the gas temperature becomes too high; hot gases can be by-passed.

Bags are now housed in a corrugated structure with a naturally ventilated shed roof. Walkways are provided on top for repairs and inspection.

Dust recovery is nearly 100 percent; all dust is returned to the source.

The wet-process plant at Victorville, Calif., uses 11½-in-diam. bags on one 330-ft. kiln. This installation will filter more than 100,000 cfm. Temperatures in the baghouse are kept well above the dew point to prevent condensation in the bags.

END



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The specially alloyed steel wire used in STARSTEEL Screens is specifically made for extreme resistance to abrasion. This, plus rigid, accurate weaving to prevent buckling and distortion, and precision-applied hook strips that keep the screen under tight, uniform tension, gives STARSTEEL twice the life in the toughest jobs.

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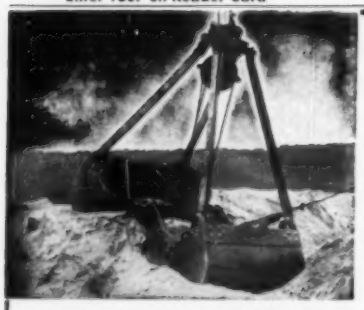

In a Hayward, there's no contact between the closing mechanism and the material handled. This means much less wear, reduced upkeep, big savings in bucket maintenance. THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

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Core plant *continued from page 113*

Blending sand is trucked to the plant in bottom dumpers. The trucks unload at a hopper that serves a belt conveyor to the blend sand pile. This is a small surge pile over a reclaim tunnel in which a belt conveyor and a vibrating feeder operate. As each truck moves into the unloading position, an electric eye starts the conveyor, which runs for a predetermined time—long enough to stockpile the truckload. The blending sand supplies the midsizes that appear to be lacking in the pit-run.

Twin 30-in. sand screws and a 36-in. sand preparation machine receive a split feed. The belt conveyors that finger out over the reclaim tunnel have been elevated considerably in the new plant to give added storage capacity. The radial stacker section of the sand belt is swung from a gin pole, which distributes the sand to different piles to allow the 72-hr. drainage required by specifications.

All finished sand and gravel is piled over reclaim tunnels, with rock ladders used on the coarser sizes. Reclaim gates in the tunnel are manually controlled. **END**

Washing plant *continued from page 87*

added rinsing dewatering screen, so that the fines and dirt passing through it can be flumed away. Plants of this type are capable of simultaneously turning out fairly large quantities of two sizes of coarse material, one of sand and an oversize.

A somewhat similar plant has a crusher for reduction of oversize and a return system to the screen. Water is sprayed onto the two-deck screen, which produces one size of aggregate plus sand. Portable plants with vibrating washing-sizing screens frequently are set up to follow portable gravel crushing plants.

A plant for extremely dirty material and close sizing has a revolving scrubber of large dimension, a shaker-type horizontal screen for sizing and rinsing and a roll crusher for reduction of oversize. For dry screening and crushing, material feeds directly onto the shaker screen from the same end of the plant as the scrubber feed. Changing the screen hanger location reverses movement of material across the screen.

When moving a plant equipped with a revolving scrubber, it is customary to remove the scrubber to cut down height and weight.

A portable plant frequently cannot be justified unless adequate water can be made available without too many pumping, piping and waste disposal problems. If such problems exist in high degree, there is nothing to be gained by having the plant on wheels and rubber. In such cases, economy

Please turn to page 124

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NEW S-12

joins Euclid Rear-Dump Line!

The Model S-12 Euclid-Easton hauler—with payload capacity of 44,000 lbs.—is a new size Euclid over-hung engine type semi-trailer rear-dump. Designed and built as a complete, balanced unit, it combines the experience of two leading manufacturers of hauling equipment for mines, quarries and heavy industrial and construction work.

With 218 h.p. and 5-speed gear transmission the S-12 has a fast travel speed and ample power for the toughest jobs. Big 24.00 x 25 tires on all wheels provide traction and flotation for operation under conditions that would stop other haulers. For work in close quarters the 90° hydraulic steering and variable wheel base gives the unit exceptional maneuverability and helps cut cycle time.

Well reinforced body is constructed of special alloy steel to withstand the impacts of shovel-loaded rock and heavy excavation. Single stage double-acting hoists raise the body quickly, with smooth positive control all during the dumping cycle.

Have your Euclid dealer show you how this Model S-12, or the 12 and 35 ton semi-trailer models with 143 and 325 h.p., can cut hauling costs. He'll be glad to tell you about other Rear-Dump "Eucs" of 10 to 50 ton capacity, too.

EUCLID Division of General Motors Corp., Cleveland 17, Ohio

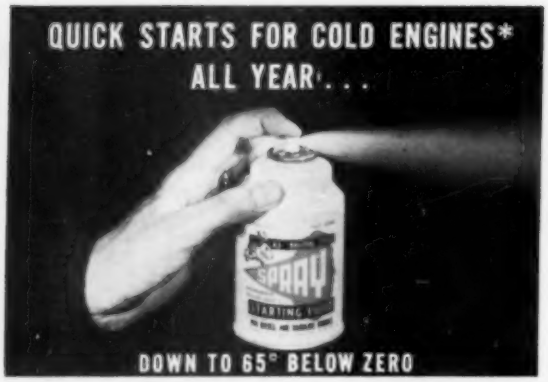
22-ton capacity
14 yds. struck
218 h.p.
24.00 x 25 tires
22.6 mph top speed

Euclid semi-trailer rear-dumps are available in 3 capacities—12, 22 and 35 tons with 143, 218 and 325 h.p. Tractors for these models are interchangeable on 7, 12 and 21 yd. scrapers.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



Starting a cold engine without SPRAY STARTING FLUID is costly. Constant wear of the starting system . . . wasted man hours . . . equipment down-time . . . repeated engine strain, can be prevented with a pressurized can of SPRAY STARTING FLUID. It's so easy to use! Apply SPRAY STARTING FLUID into the air cleaner or intake air stream while cranking the engine. Continue spraying until the engine runs smoothly. Use SPRAY STARTING FLUID regularly for quick, easy and economical starting of diesel and gasoline engines. Start every work day with SPRAY!

*Until the engine reaches normal operating temperature it is a cold engine.

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one without tires . . .

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Washing plant *continued from page 122*

would dictate the use of a semi-portable plant, well unitized, to facilitate moving. Even on large jobs, the washing plant will not be moved any oftener than necessary to maintain over-all efficiency of the whole aggregates supply operation.

Since water supply is a big problem, the question arises: "How much water is enough?"

No hard and fast rule for the amount of water required for washing coarse aggregate can be established. A rule-of-thumb guide, however, is suggested for washing under average conditions. This rule indicates that 10 gpm. are required for each cubic yard of material produced per hour. For example: 50 cu. yd. per hour will require 500 gpm.

Table I helps to determine the number and size of spray nozzles to provide the required gallonage for a given nozzle pressure. For example: If nozzle pressure is 50 psi., each ¼-in. nozzle will give 8 gpm. and each 5/16-in. nozzle, 12.5 gpm. Thus, if 600 gpm. are required, it will take 75 ¼-in. nozzles (600 divided by 8) or 48 5/16-in. nozzles (600 divided by 12.5).

This table can be used also to determine the pressure required to deliver a specific gallonage through the nozzles. For example: If 500 gpm. are required and 60 ¼-in. nozzles are used, each nozzle will give 8 gpm. (60 x 8). If pressure is stepped up to 60 psi., each nozzle will give 8.8 gpm. for a total of 528 gpm. (60 x 8.8).

No attempt has been made in this series to discuss or develop, from a functional standpoint, any of the large stationary plants that have sprung up in many areas to meet specific washed and sized aggregates needs. Many such installations have been covered in ROCK PRODUCTS. Such coverage will be increased as the need grows for clean, sound, well graded and properly sized aggregates from the coarsest to the finest. Research to determine the quality needed in construction materials is a never-ending business among engineers and designers of buildings, dams, bridges, highways and airports, and it is certain that tighter specifications will follow as quickly as new machinery and methods are developed.

TABLE I. FLOW OF WATER THROUGH PLAIN PIPE NOZZLES (in gpm.)

Water Pressure (psi.)	NOZZLE SIZE			
	¼"	5/16"	⅜"	7/16"
20	5.1	7.9	11.4	15.5
40	7.2	11.2	16.1	21.9
60	8.8	13.8	19.7	26.9
80	10.1	15.8	22.8	31.0
100	11.4	17.7	25.5	34.8
120	12.4	19.4	27.9	38.0

END

Largest jaw crusher

continued from page 79

in 12 segments with machined surfaces at the back and are held in place by bolts and wedges.

The swing jaw is a huge box-section, cast steel piece mounted at its upper end on a 16 in. diam. forged-steel shaft with ends fitted in the frame.

Drive is through a very heavy cast steel crank mounted on a forged and heat-treated carbon steel eccentric shaft running in double-row roller bearings of really exceptional size, 25 in. ID x 36¼ in. OD x 8¼ in. wide for the crank and 20 in. ID x 33 in. OD x 10¼ in. wide for the fixed bearings. Total weight of the four bearings is 2½ tons. They are protected against dust intrusion by carefully designed double-labyrinth seals.

The eccentric shaft carries at each end a heavy 11 ft. 10 in. diam. cast-iron flywheel. The rim of one flywheel is grooved to take 15 1¼ x ¾ in. V-belts. The crank operates the swinging jaw through two plates acting as knuckles. These toggles are made of welded steel with chilled cast-iron butt-ends which act as swivels. One toggle is designed as a safety device in case unwanted materials of large size are accidentally introduced into the crusher. The swivels are lubricated at various points by grease from a mechanical lubricator fitted with 36 pumping points.

Correct performance of the swinging jaw is maintained by four suspended rods fitted with springs. Shims placed behind the toggle bearing or rear knuckle adjust the lower distance between jaws. Steel ladders and footways are provided to permit easy access to the various moving parts. Net weight of the complete crusher unit is 250 tons; the weight of the heaviest part is 45 tons.

Power is supplied by a 300 hp. motor and speed of the crusher is 120 rpm. A traveling crane with a capacity of 45 metric tons was specifically designed for the installation and maintenance of the all-steel crusher. END

SPECIFICATIONS FOR DRAGON JAW CRUSHER

Opening	8 ft. 3 in. x 5 ft. 3 in.
Speed	120 rpm.
Weight	250 metric tons
Power required	300 hp.
Flywheel	11 ft. 10 in. diam. x 2 ft. 4 in. wide
Weight of a bare frame side part	35.1 metric tons
Weight of swing jaw complete with shaft and jaws	45 metric tons
Weight of crank complete with shaft but without flywheel	29 metric tons
Weight of flywheel	18.25 metric tons
Capacity of overhead traveling crane	45 metric tons

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Drivers say they like Diamond T Trucks because of their excellent ride, faster shifting and *easy steering*—thanks to Garrison Power Steering.

With hydraulic power doing 80% of the work of turning, drivers get rigs in and out in a hurry, with far less fatigue. Equipment takes less of a beating, too. Shocks from rough terrain are absorbed by the power cylinder—not the steering mechanism.

Garrison Power Steering is available for larger models of Diamond T Trucks and can be installed as optional equipment at the factory, or provided in kit form for field installation. Get in touch with your Diamond T dealer today for complete information.

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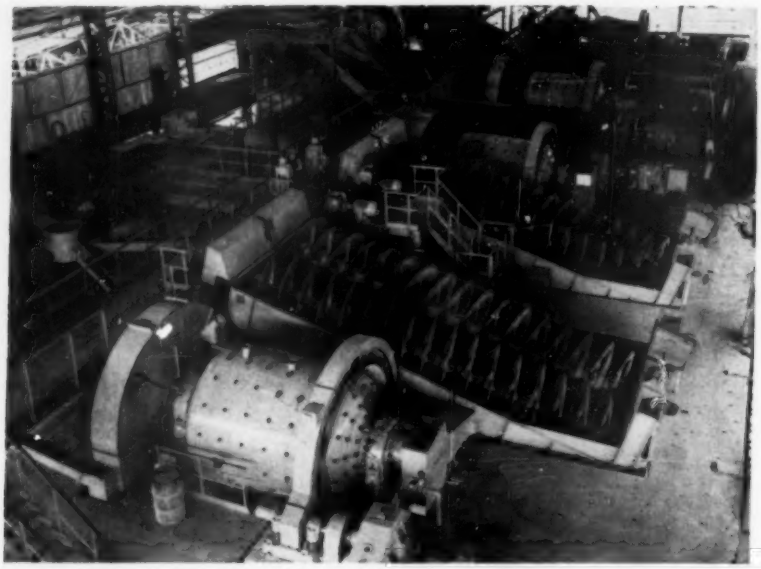
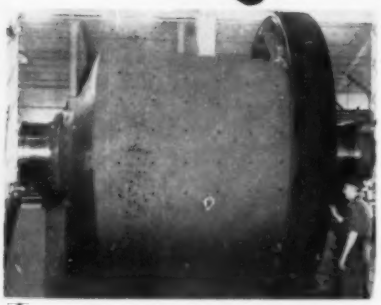


Shown here are four Hardinge 9-3-6-8 Tricone Mills grinding sulfide copper ores and mixed ores in a concentrating plant in the Belgian Congo, Africa.

CORRECT BALL SEGREGATION
in the
Hardinge TRICONE MILLS

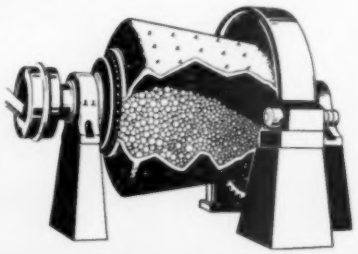


Shop view of a 10½′ Tricone with 9′ long tapered shell.

Highest grinding efficiency and lowest ball and lining wear are common to mills with a correctly segregated ball charge. The Hardinge Tricone Mill is the only mill providing these essentials to low cost operation without the use of special linings or internal devices, which are subject to wear and are effective through only a part of their wearing life.

The Tricone also occupies less floor space for its grinding volume than any other ball mill built.

Every ball in the Hardinge Tricone Mill "minds its own business!" ▶



Complete specifications upon request. Bulletin AH-414–7

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ROCKY'S NOTES

(Continued from page 19)

case of very large operators this probably is not feasible or necessary. However, were he to put in enough storage capacity to do this, he would also help solve his problem by doing his own blending—another inference we do not consider "destructive." We know of a very few large operators who already have introduced substantial storage capacity, not primarily for such blending, but to assure an ample supply of cement during periods of scarcity, or to take advantage of off-season production when shipments lag. By purchasing cement in periods of lower demand, and storing it on their own property, they not only have it when needed, but they are helping the cement manufacturer even out his own shipments. Therefore, our suggestion that the producer supply his own storage for a 28-day testing period or longer seems to us to be a constructive, not a "destructive" suggestion.

We recited several reasons, physical and chemical, why present-day high limed or relatively early high-strength cements are likely to be variable in their physical properties—that is, if they are the kind designed to have a high tricalcium silicate content. Any student of the literature of cement and concrete is amply justified in drawing the same conclusion. Moreover, any reader of the various articles we have written in this book during the past several years knows that we have often expressed the same opinion before — without contradiction. According to our observation the portland cement industry, a generation ago, was driven into the manufacture of such high-limed cements by competition of the kind we deprecated in the "Notes" article referred to. The users began demanding quicker hardening concrete without having had adequate experience with it; and apparently the most economical manufacturing process to achieve that end was to get more tricalcium silicate into the cement. Some manufacturers of a generation ago had serious doubts that they were actually getting a better, all-purpose cement by combining more lime, but they were compelled "to follow the crowd."

To our mind, conditioned by that fact, (and perhaps there are others still of the same mind) the recent tendency of the same users to demand blended cements with additions of pulverized slag, pozzolan, or natural cement, is largely to overcome the disadvantages of high-limed cement by reducing the tricalcium silicate content of the blend-

ed cement proportionately. The additives reduce the temperature of the hydration, much to be desired in mass concrete, and eventually supply more of the lower limed silicates, either directly as in slag, or after hydration of the cement and the sloughing off of excess lime as a hydrate. To us this seems but a roundabout way of getting the benefit of a dicalcium silicate, when a portland cement clinker with higher percentage of dicalcium silicate would accomplish the same end directly by finer grinding. We think these tests give added proof of this fact. And no one, so far as we know, disputes that a finely ground cement relatively high in dicalcium silicate is apt to make for ultimately higher strength and more durable concrete than a high tricalcium silicate cement. We firmly believe that eventually some of the present troubles with concrete will be traced to the excessive lime content.

We are sorry for our remarks about the variations in the cement tested by the NRMCA having possibly been due to the great desire of manufacturers to produce more cement and faster during the years of short supply, if that is offensive to any manufacturer. It seems a plausible reason, and one not likely to be repeated, at least in the near future. We did not accuse any one of them of doing this; we merely suggested it as a possible explanation, but one not likely to be permanently established. It was more of an apology for something that may have happened in 1956; and may not be at all applicable to the present situation—at least we hope not. **END**

Capacity demand boosts gypsum sales

GYPSUM, LIME & ALABASTINE CANADA, LTD., Toronto, Canada, reported net profits for the first nine months of this year 34.3 percent higher than for the similar period of 1957. With a net profit of $1,892,000, per-share profits were $2.14.

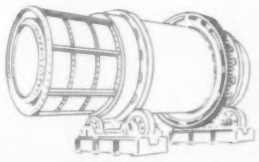
President Philip N. Gross said that the company's plants have been operating at capacity because of the substantial volume of residential construction. More manufacturing capacity will be available when construction at the company's New Westminster, B.C., plant is completed. A new source of raw materials has been secured in the Maritimes and is being developed.

Meanwhile, the company's plaster mill in Montreal East has been modernized and expanded and a lime pulverizing plant at Beachville, N. S., is going into production.

Very Good Performance
IN AN EXTREMELY DIFFICULT CLAY CONDITION

This progressive firm reports excellent results in breaking up clay lumps contained in gravel with a McLanahan 8′ x 16′ Revolving Scrubber. Installed near Lillington, N. C., the unit is effectively cleaning 150 tons per hour of 4½" to 1" feed prior to the screening and crushing operations.

Let us show you how McLanahan Scrubbers deliver high tonnages of exceptionally clean material. *Write for details.*



McLANAHAN
SINCE 1835
HEAVY-DUTY
SCRUBBERS

McLANAHAN & STONE CORPORATION
252 WALL STREET, HOLLIDAYSBURG, PA.
Enter 1280 on Reader Card

Plain Primacord Trunk Line. Is used also for shallow holes — wherever resistance to abrasion and cutting is not required. Textile covered, flexible, resilient, with a tacky non-slip surface. Tensile strength 125 lbs. — 1000 ft. spool weighs 18 lbs.

Plastic Wire Countered Primacord Branch Lines. Used in deep, ragged holes — and especially where metal or rigid fibre explosives containers are used — wherever strength and resistance to abrasion and cutting are essential. Armored with wire and covered with plastic material. Tensile strength 300 lbs. — 1000 ft. spool weighs 32 lbs.

The knot shown is the clove hitch made in the Plain Primacord trunk line and drawn tightly around the twin branch lines.

All dressed up and waiting for you!

This Primacord hook-up could be one hole or a thousand, loaded and primed. But it's not ready to "go" until you attach the fuse and cap or electric blasting cap onto one end of your Primacord trunk line.

This is because Primacord, the proved and approved detonating fuse, *must be detonated* before it can send its explosive wave into your primers or directly into your explosives charges.

The danger of premature shots is reduced to a minimum because Primacord cannot be set off by normal vibration or friction, ordinary impact or sparks, or stray electrical currents. Even a direct hit by lightning failed to detonate it.

When it goes, you'll get a blast you can be proud of!

For further information see your explosives supplier or write to

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut • Since 1836

Primacord® and Detacord® Detonating Fuse, Safety Fuse, Ignitacord®, Quarrycord®, Pyrotechnical Devices and Blasting Accessories

Hook-up and detonate with

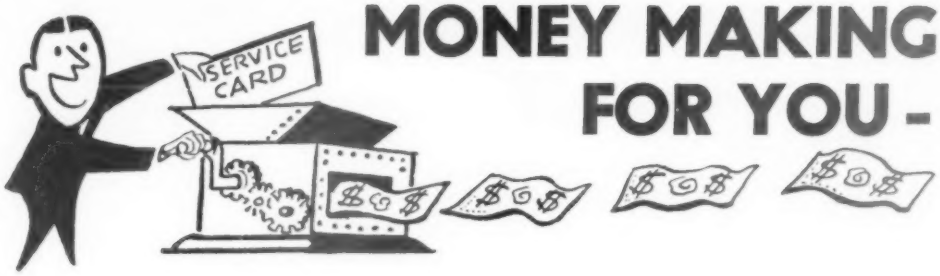
PRIMACORD®

and guard against *Stray Current* hazards

The square knot is used only above ground, to lengthen a trunk line of Plain or Reinforced Primacord, or to tie in Primacord M S Connectors. It must be drawn up tight.

P-d

Enter 1220 on Reader Card



MONEY MAKING IDEAS FOR YOU - - - FREE

USE THESE CARDS FOR MORE INFORMATION ON:

1. **Advertised Products**
2. **New Machinery**
3. **New Literature**

How to use:

Each advertisement in this issue is provided with a key number, so is each new machinery and new literature item. For more information on any of these items simply fill in the key numbers in the appropriate space on the adjoining card and send it to us. We'll do the rest.

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No Postage Stamp Necessary If Mailed in the United States

FIRST CLASS
PERMIT NO. 1417
CHICAGO, ILL.

– POSTAGE WILL BE PAID BY –

ROCK PRODUCTS
79 WEST MONROE ST.
CHICAGO 3, ILL.

READER-SERVICE CARD RP-12-58

ROCK PRODUCTS
79 W. Monroe St.

DECEMBER, 1958
Chicago 3, Illinois

Cannot be serviced after February 1, 1959 postmark.

Please print or type

Name_____ Position_____

Company (In Full)_____

Company Address_____ City_____ Zone_____ State_____

MAIN PRODUCT OF PLANT_____ CAPACITY_____

[THIS INFORMATION WILL HELP US GIVE YOU MORE COMPLETE SERVICE.]

Send information on items identified by key numbers beside or below items of interest to you. List your choice in numerical order. Limit 10 per card.

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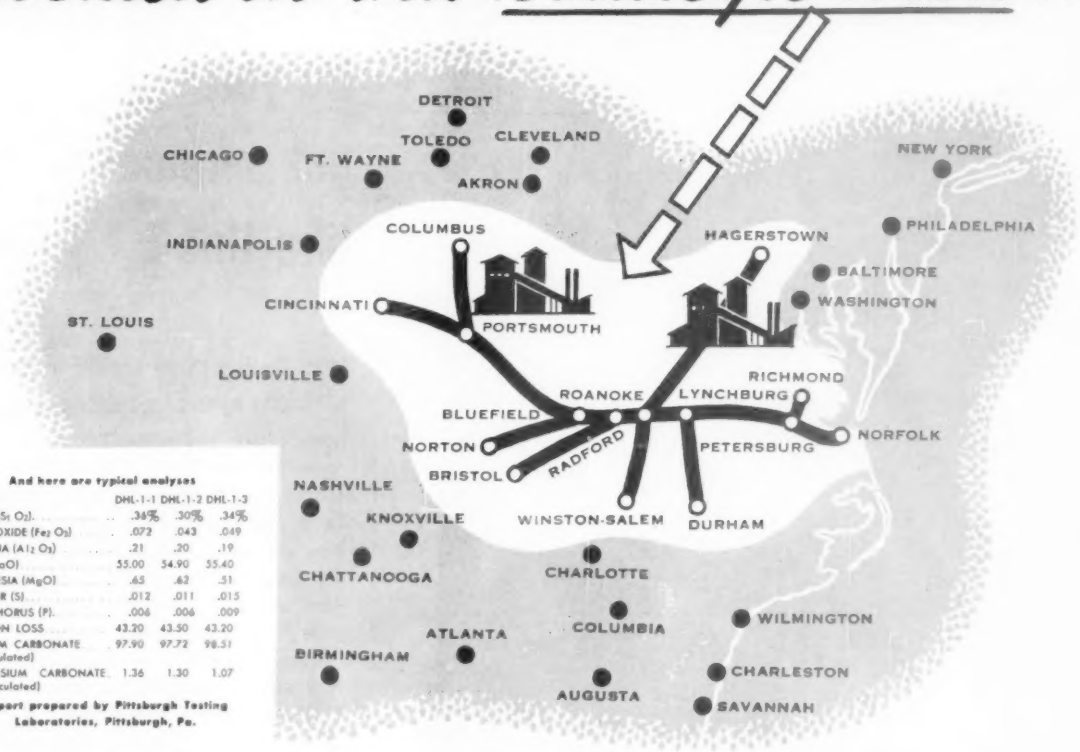
a ROCK PRODUCTS PLANT located in this strategic area...



And here are typical analyses

	DHL-1-1	DHL-1-2	DHL-1-3
SILICA ($Si O_2$)	.36%	.30%	.34%
IRON OXIDE ($Fe_2 O_3$)	.072	.043	.049
ALUMINA ($Al_2 O_3$)	.21	.20	.19
LIME (CaO)	55.00	54.90	55.40
MAGNESIA (MgO)	.65	.62	.51
SULPHUR (S)	.012	.011	.015
PHOSPHORUS (P)	.006	.006	.009
IGNITION LOSS	43.20	43.50	43.20
CALCIUM CARBONATE (Calculated)	97.90	97.72	98.51
MAGNESIUM CARBONATE (Calculated)	1.36	1.30	1.07

Report prepared by Pittsburgh Testing Laboratories, Pittsburgh, Pa.

can serve a great, expanding market

The demand for limestone products is growing by leaps and bounds. Cement production for highways alone amounted to 60 million barrels in 1955, and this is expected to jump to 110 million by 1961.*

This represents but a fraction of the bright business potential forecast for manufacturers of cement, steel and other construction products by leading economists. Because of these facts, you may be considering the relocation of your plant nearer to needed production materials and booming markets.

We urge you to investigate *The Land of Plenty*, the progressive six-state territory served by the Norfolk and Western. Here are tens of millions of tons of high calcium limestone, nearly pure dolomite and excellent quality construction stone; an abundance of superior Bituminous Coal and ample water for production; good building sites served by dependable N&W transportation — plus nearness to many of the nation's biggest and fastest growing markets.

N&W plant location specialists will be glad to furnish detailed information on these and other competitive advantages of *The Land of Plenty* . . . or aid you with your specific plant location problems. There's no obligation.

* *Estimate of the U. S. Department of Commerce*

Write, wire or call—

L. E. Ward, Jr., Manager, Industrial and Agricultural Dept.
Drawer RP-822 (Phone Diamond 4-1451, Ext. 474)
Norfolk and Western Railway, Roanoke, Virginia

Norfolk and Western RAILWAY

Enter 1324 on Reader Card

Do you get service like this?

USS Rolled Plate Lining mills 1,000,000 tons of gold-bearing ore before being replaced

HOMESTAKE MINING COMPANY, Lead, South Dakota, grinds gold-bearing quartz, two-thirds of the ore being of unusually hard rock. The ball mill produces a grind to pass 65% through 200 mesh.

Recently, the #2 unit in the ball mill was relined and performance of the previous 26-month-old USS Rolled Plate Lining was evaluated. The heavy lining consisted of 24 tons of 3″ plate and 5″ lift bars. It was in operation 773.75 days and milled 1,051,034 tons of ore, an average of 1,358 tons per operating day.

Because USS Rolled Plate Linings are made of *rolled* steel, they have superior toughness. Lift bars are rolled alloy steel and heat treated to obtain extra hardness and toughness through the lift portion of the lining. Both plates and bars are made to close tolerances for snug fit.

Our technical personnel will be glad to advise on any tough grinding problem.

Original lift was 2½″. Lift remaining at replacement measures a full 2″. Liner plates are worn to less than ¼″ in the valleys. There was no evidence of breakage in either plates or bars.

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Export Company

USS TRADEMARK

United States Steel

NEW LITERATURE

Industrial installations

WESTERN KNAPP ENGINEERING CO. has published a booklet entitled "Design for Progress," outlining its approach to the design and construction of modern industrial installations. It describes the WKE methods of project development, project management, design and engineering and finally, plant construction.

Enter 600 on Reader Card

Ice melting chemicals

CALCIUM CHLORIDE INSTITUTE has released a booklet describing tests of ice melting chemicals made at the University of Minnesota. According to the booklet the tests show that calcium chloride melts 8 times as much ice as rock salt in the first 30 min. at a temperature of 20 deg. F.

Enter 601 on Reader Card

Vibrators

HYDROTILE MACHINERY CO. has issued a booklet illustrating and describing its Elektror vibrator in five sizes and eight models. Mounting clamps and adaptors are shown for several uses, the swing base types for reciprocal vibration and solid base types for vibration in all directions.

Enter 602 on Reader Card

Speed reducers

LINK-BELT CO. has issued Booklet 2618 describing its new line of shaft-mounted speed reducers. The units are available as single reduction drives in six sizes, with nominal ratios of 5 to 1 and capacities up to 50 hp., and double reduction drives in seven sizes, with nominal ratios of 15 to 1 and capacities up to 40 hp.

Enter 603 on Reader Card

Rotary gates

DUCON COMPANY, INC., has issued Bulletin V-3558 illustrating and describing four styles of Type G gates for dust collection, pneumatic conveying, feeding applications and various discharge applications—style 4 with a 4-blade open-end rotor; style 6 with a 6-blade open-end rotor; style 6C with a 6-blade closed-end rotor; and style SP with either a 4 or 6-blade shallow pocket rotor. Included are a discussion of selection factors and dimensional and capacity information.

Enter 604 on Reader Card

Classifying systems

THE BUELL ENGINEERING CO., INC., has published a bulletin explaining the general operating characteristics of both the centrifugal and gravitational type classifiers. Thirteen advantages of the new systems are listed.

Enter 605 on Reader Card

Woven wire screens

SIMPLICITY ENGINEERING CO. has released Bulletin No. 67 showing, with on-the-job photos, the cutting of the wire and the forming and banding of the edges. Charts list the many types and sizes of woven wire screens that are now in stock.

Enter 606 on Reader Card

Jaw crusher

ROGERS IRON WORKS CO. has released Bulletin 58-2 describing 13 crusher sizes in the heavy-duty line and 7 sizes in the roadbuilder series. Dimensional drawings and capacity tables are supplied as well as a product chart of size percentages.

Enter 607 on Reader Card

Rock bits

VAREL MANUFACTURING CO. has issued a catalog on rotary rock bit types and their specifications. Some of the other tools described are the drill pipe and tubing and tool joints, drilling and coring bits and drag bits.

Enter 608 on Reader Card

Wire rope belt conveyor

THE JEFFREY MANUFACTURING CO. has released Bulletin 948 describing its wire rope belt conveyor. Illustrations show types of carrying idlers, rope stands with return idlers and installation views.

Enter 609 on Reader Card

Submersible pump

STENBERG MANUFACTURING CORP. has released literature on the B-80L Flygt pump developed in Sweden. The unit consists of a centrifugal pump with vertical shaft and a watertight, built-in ac. motor. Some of the practical uses of the pumps are in building sites, tunnels, shafts, excavating, well sinking, dock and harbor works.

Enter 610 on Reader Card

Telescopic hoists

DAYBROOK HYDRAULIC DIVISION, Young Spring & Wire Corp., has released three catalog specification sheets on its line of telescopic hoists. Covered are the Series 3B and 3C hoists for truck dump bodies and Series T-3C, T-4C and T-4D for trailer dump bodies.

Enter 611 on Reader Card

Rubber mounted cranes

KOEHRING DIVISION, Koehring Co., has released a bulletin discussing 15 to 45-ton lift capacity, rubber-mounted cranes. The bulletin shows a total of 11 photos of the mobile equipment with commentary on each size crane.

Enter 612 on Reader Card

Car shaker

SYNTRON CO. has issued a booklet on the new electromechanical car shaker that empties railroad hopper cars. The 4-hp., self-lubricating motor produces 850 vibrations a minute and unloads coal, rock, sand, gravel and other hard-to-handle bulk materials.

Enter 613 on Reader Card

Sand classifying

MECKUM ENGINEERING, INC., has issued two bulletins on sand classifying. Bulletin B-901-758 discusses how automatic sand classifier slashes costs for an Indiana producer; and Bulletin 900-3-858-2 illustrates and describes sand making and classifying by automation. A typical, compact plant layout is included.

Enter 614 on Reader Card

END

Enter 1249 on Reader Card

NEW MACHINERY

Three-way body dumps to left, right and rear

A DUMP BODY which dumps to the left, to the right and to the rear has been developed. This three-way feature is said to increase vehicle life, make a speedier round trip and provide maximum payload.

Features of this dump body included a welded-steel body with 10-ga. sides, stiffeners and floor; a tubular-steel subframe; grease fittings on all moving parts; four-stage telescopic hoist; lifting capacity of 36,000 lb. The body is adaptable to all standard chassis. All gate levers are within reach of the driver from the cab; all hydraulic and pto. controls are also accessible on the dashboard and floor. Maximum dump angle is 60 deg. *Koenig Iron Works, Inc., P.O. Box 7726, Houston 7, Texas.*

Enter 200 on Reader Card

New unit mechanizes blast hole loading

TO MECHANIZE THE LOADING of fertilizer-grade ammonium nitrate, a blow-loading machine has been developed which uses compressed air to blow the blasting agent, and also sand stemming, into blast holes. Working tests have demonstrated that the machine, as now developed, can blow 2½ lb. per second of ammonium nitrate and diesel oil mixture into a 50 to 60-ft. horizontal blast hole. Four 80-lb. bags were loaded into one hole in 2 min.

Basic equipment required for use with the Jetloder includes a compressor to provide air at 45 psi.; a truck to move the compressor and blow-loading machine; a sufficient amount of 1½-in. (ID) plastic pipe to reach from the machine to the back of the blast holes. This machine has no moving parts except the closing device and the valve which admits air. *Atlas Powder Co., Wilmington 99, Del.*

Enter 201 on Reader Card

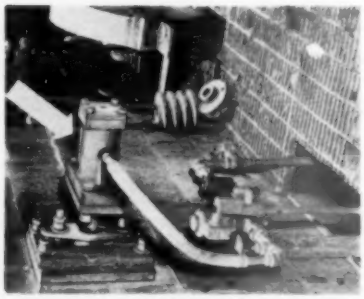
Vertical slurry pump

A NEW VERTICAL, heavy-duty slurry pump (type RXV) for submerged operation in wet pit sump service is designed to handle the heaviest slurries of sand, tailings, etc. The RXV pump is available in nine models varying from 2 to 8 in. Features include low speed and continuous duty with both heavy and fine slurries. Quick dismantling is possible; only four bolts clamp the liquid end of the pump.

All wearing parts are interchangeable with the manufacturer's now-operational RX horizontal pump unit. Bearings are water lubricated. (Grease is available if desired.) *Morris Machine Works, Baldwinsville, N.Y.*

Enter 202 on Reader Card

Air vibrator



A VIBRATOR for electrostatic precipitators and dust collectors is a heavy-duty unit with a one-piece construction design. According to the manufacturer, there are no body assembly bolts to shear or stretch, and the piston is the only moving part. The manufacturer further states that the unit, designated the BH-3-SP, practically eliminates maintenance problems.

This vibrator can be arranged with a timer and solenoid valve for complete automatic control. It weighs 52 lb. and measures 11 x 5 x 10½ in. *National Air Vibrator Co., 2372 W. 7 St., Cleveland 13, Ohio.*

Enter 203 on Reader Card

(Continued on page 136)

SYNTRON

"Vibra-Flow"

VIBRATORY FEEDERS

provide the controlled flow of bulk materials to processing equipment

SYNTRON Vibratory Feeders are designed for high capacity, variably controlled feeding of bulk material to crushers, conveyor belts, screens and other process equipment.

Years of experience in the mining and quarrying industry have proven SYNTRON Vibratory Feeders to be . . .

Efficient — the instantly controlled rate of material flow and the high capacity of SYNTRON Feeders keep process equipment operating at maximum capacity. This means lower cost per ton.

Dependable — SYNTRON'S powerful electromagnetic drive assures a free flow of hard-to-handle materials at higher tonnage rates. Simplicity of design means longer life, lower maintenance costs.

Versatile — Compact design makes SYNTRON Feeders easy to install on most operations. Can be suspended or floor mounted.

Their ability to handle most materials — fine powders or heavy run — of — quarry stone, damp or dry, hot or cold in capacities from pounds to hundreds of tons per hour make SYNTRON the best feeder you can buy.

There is a SYNTRON Feeder for every application large or small. RP 758

Builders of quality equipment for more than one-third of a century

Other SYNTRON Equipment of Proven Dependable Quality

designed to increase production, cut production costs, improve products

- Vibrators (bins, hoppers, chutes)
- Vibratory Feeders
- Vibratory Screens
- Shaker Conveyors
- Vibratory Elevator Feeders
- Weigh Feeders
- Packers and Jolters
- Hopper Feeders
- Lapping Machines
- Rectifiers (Silicon and Selenium)
- a-c to d-c Selenium Rectifier Units
- Electric Heating Panels
- Electric Heating Elements
- Sinuated Wires
- Shaft Seals
- Electric Hammers
- Concrete Vibrators
- Paper Joggers

Our representatives will be glad to work with you in selecting the proper equipment for your operation.

Call your nearest Syntron representative

Write for a SYNTRON Illustrated Catalog — FREE

SYNTRON COMPANY
450 Lexington Ave. Homer City, Penna.

Enter 1224 on Reader Card

NEW MACHINERY

(Continued from page 134)

Tubeless transmitters

SOLID STATE RATHER than vacuum-tube amplifiers are used in new transmitters introduced for electronic control of process variables. These transmitters are of motion balance design and transfer field measurements of pressure, flow, liquid level or temperature to panel mounted receivers.

In transmitter operation, the measurement is sensed by standard measuring elements, such as a pressure spring. Motion of the element is converted by a transducer and rectifier to provide a filtered dc. signal of high output level. The magnetic amplifier provides stepless 25 to 1 amplification of current through the receiver.

The new type 630 transmitters produce mechanical motion for local indication of measurement even when power fails. Indicating scale with white pointer and white markings on black dial can be read from a distance. Steel case with polyester cover is weatherproof, accommodates alarm units and can be surface or yoke mounted. *The Foxboro Co., Forboro, Mass.*

Enter 204 on Reader Card

Sand classifier designed to operate hydraulically

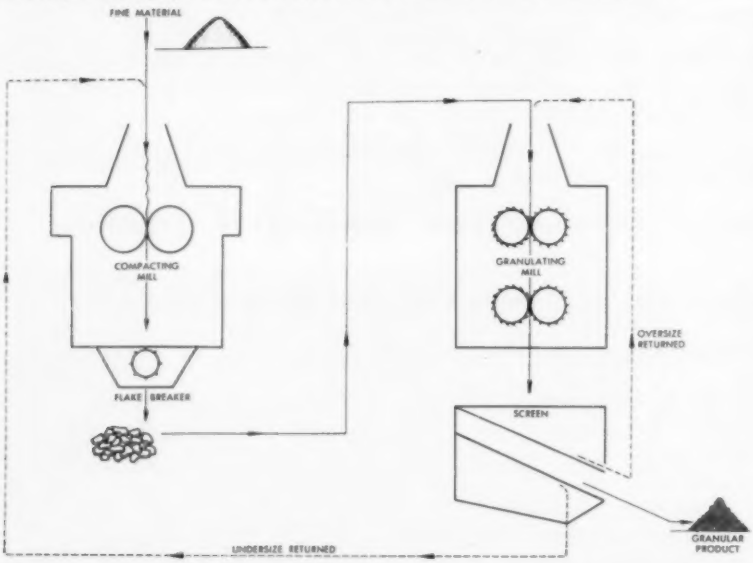
THE FLOATEX SAND CLASSIFYING system has recently been placed in operation in this country. The system offers fully automatic, hydraulic classification of sand, according to the manufacturer. It is claimed to be the most economical method of producing specification sand available today.

Only one rubber-lined materials handling pump carries sand through the system. No other moving parts require maintenance. Other units in the system include a static cone for initial washing and concentration, an intermediate washing and concentrating tank, and a group of four cones for final washing and blending.

Advantages claimed are that finer grades of sand down to minus 200 mesh can be obtained, any grade not wanted in the final blend can be set aside and adjustments may be made easily to compensate for daily fluctuations in the quality of the pit-run sand. *Meckum Engineering, Inc., 53 W. Jackson Blvd., Chicago 4, Ill.*

Enter 206 on Reader Card

Compacting process recovers waste fine material



A CONTINUOUS COMPACTING PROCESS for upgrading fine chemical salts can be applied to other materials where particle size, density and solubility rate need close control. In many cases, these fines have been considered waste. The process consists of compacting fine particles between two rolls under extremely high mechanical pressures to produce a continuous sheet of material; breaking the sheet with a flake breaker; granulating the pieces between two corrugated rolls operated at differential speeds and screening the product for desired size. *Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*

Enter 205 on Reader Card

Rear-dump truck

A NEW REAR DUMP of 22-ton payload capacity, Model S-21, consists of an overhung-engine type tractor with a variable wheel base semi-trailer. The tractor is powered by a 218-hp. diesel engine and is equipped with a five-speed transmission.

The unit is said to provide exceptional maneuverability for close-quarter operation in mines, quarries, industrial and earthmoving work. Hydraulic steering enables the tractor to make a full 90-deg. turn and the complete unit can make a non-stop turn in just a little more than its 28 ft. 8 in. length.

The trailer is constructed of high-strength, heat-treated alloy steels to withstand the impact and wear of heavy rock and abrasive material. A feature of the trailer is a new single-stage, double-acting hoist. This body hoist gives the operator full control of the body position through the dumping cycle—there is no sudden shock or jar when the body reaches its maximum height or returns to travel position. *Euclid Division, General Motors Corp., Cleveland 17, Ohio.*

Enter 207 on Reader Card

(Continued on page 138)

PORTER BROWN LIMESTONE COMPANY—

100% MURPHY DIESEL

Plant at Springfield, Tenn. . . . . 100% MURPHY POWERED

Plant at Oneonta, Alabama . . . . . 100% MURPHY POWERED

Owner Porter Brown and Superintendent William Boring . . 100% SOLD ON MURPHY DIESEL

Here's why Porter Brown Limestone Company, of Springfield, Tenn., *specifies* Murphy Diesel power when they buy crushing equipment—

"*In view of Murphy's good service at our other plants, we specified Murphy power when we bought equipment for our Oneonta plant. Murphys are satisfactory in every way . . . especially for low operating costs and less maintenance. We're sold 100% on Murphy Diesel.*"

Porter Brown's plant at Oneonta (shown below) is averaging 1500 tons per day of $1\frac{1}{4}$" minus limestone. A 161 HP (continuous) Murphy Diesel powers the jaw crusher and vibrating grizzly in the portable primary, another 161 HP Murphy powers the cone crusher intermediate scalping unit, while a 107 KW Murphy Diesel-Electric Generator Set meets the electrical requirements of the plant.

Aggregate producers and contractors throughout the country are swinging to dependable, economical Murphy Diesels for both portable and stationary plant operations.

Your nearby Murphy Diesel Dealer will gladly help you "power for profit" with the size and type of Murphy Diesel you need.

For stationary installations, Murphy's steady, uniform power and low fuel costs assure efficient power for crushers, screens, conveyors, washing equipment, etc. And don't overlook the economy advantages of Murphy Diesels for generators, pumps, compressors, or for powering or re-powering shovels. 408RO

MURPHY DIESEL

HEAVY-DUTY POWER for Rock

Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

MURPHY DIESEL COMPANY

5315 W. Burnham St. • Milwaukee 14, Wis.

SALES — PARTS — SERVICE throughout the Nation

Enter 1321 on Reader Card

FOR DEPENDABILITY
PLUS ECONOMY
REPLACE WITH
INDIAN BRAND

Get the most out of your present equipment. When you need replacements, remember we started in 1913 to build our reputation in the Manganese Steel field for dependability plus economy.

Insist on
INDIAN BRAND
MANGANESE STEEL

Shovel Dippers • Dipper Teeth
Shovel Treads
Crusher Jaw Plates
Mantles • Concaves
Bowl Liners • Roll Shells
Pulverizer Hammers
Grate Bars • Breaker Plates
Ball Mill Liners • Screen Plates
Misc. Manganese Steel Castings

THE FROG, SWITCH AND
MANUFACTURING COMPANY
Carlisle, Pennsylvania • Established 1881

Enter 1320 on Reader Card

WHO IS SAFE FROM CANCER ?

Nobody—young or old—is safe from cancer, but there are two things you can do about it.

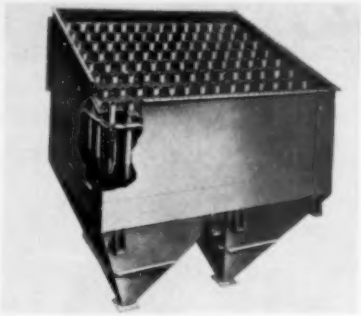
One is to have regular check-ups every year. Many cancers may be cured if detected and treated early. The other is to fight cancer with a check.

Send it to CANCER, c/o your local post office

AMERICAN CANCER SOCIETY

NEW MACHINERY

(Continued from page 136)



Dust collectors

TWO NEW DESIGNS of the Cyclotrell multiple-tube type mechanical dust collector have been announced which retain the cyclone tubes developed two years ago. One new arrangement provides for the entry of uncleaned gases horizontally through a side inlet. The second new design permits the uncleaned gas to enter the collector through an inlet in the top and leave through a side inlet.

Both designs are available in various capacities, the smallest with a single row of three tubes and the largest with 24 rows of tubes 14 tubes deep for a total of 336. Tubes are arranged in rows of 3, 4, 6, 8, 10, 12 and 14. The cyclone tubes are claimed to have both a higher collection efficiency and a greater capacity rating than conventional multiple tube collectors. This greater capacity rating permits the use of fewer tubes per installation. *Research-Cottrell, Inc., Bound Brook, N.J.*

Enter 238 on Reader Card

Ultrasonic cleaner

AN ULTRASONIC SYSTEM reportedly solves difficult problems in the cleaning of fine-mesh screens such as those used in the processing of silica sand. Because of the minute apertures and the adherent nature of the sand, the screens become clogged and require frequent cleaning. With the ultrasonic cleaning system, the screens are dipped in the "SonBlaster" tank containing tepid water and a small quantity of liquid detergent. In one minute a screen which is 80-percent clogged is said to become virtually 100-percent clear.

The unit consists of a generator, which is installed at any convenient 110 to 115 v.-60 cps. outlet and actuated by a conventional on-off switch, and a tank with integral transducer, which converts the 60-cycle current to frequencies of 60,000 or more cycles. Stock model ultrasonic cleaners range from the size of a table radio to giant 150-gal. tanks. *The Narda Ultrasonics Corp., 625 Main St., Westbury, N.Y.*

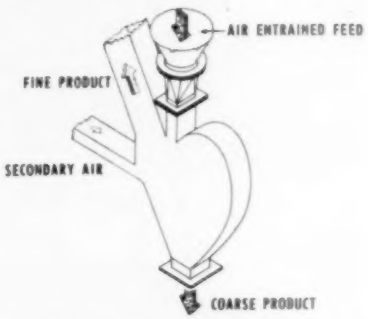
Enter 239 on Reader Card

Material is classified through control of air flow

A "GRAVITATIONAL-INERTIAL" classifier utilizes new classifying principles involving control of air velocities. According to the manufacturer, an initial field installation correctly classifies better than 95 percent of the feed.

Air or gas-entrained feed material enters the classifier through an inlet at the top and cascades downward past a set of inclined vanes through which air and entrained fines are drawn off. By controlling the velocities of the inlet air and vane exhaust air, gravitational, inertial, centrifugal and drag forces are caused to act on the particles in such a manner that those below a given size will be drawn off through the vanes and those above this size will continue to precipitate downwards.

A secondary air supply introduced below the vanes crosses the stream of coarse particles, scrubs away any adhered fines and circulates into the classifier chamber, exhausting through the vanes. It provides a means of controlling inlet air velocity and also acts along with primary-air eddy currents as a moving wall which contains the curtain of feed material within the



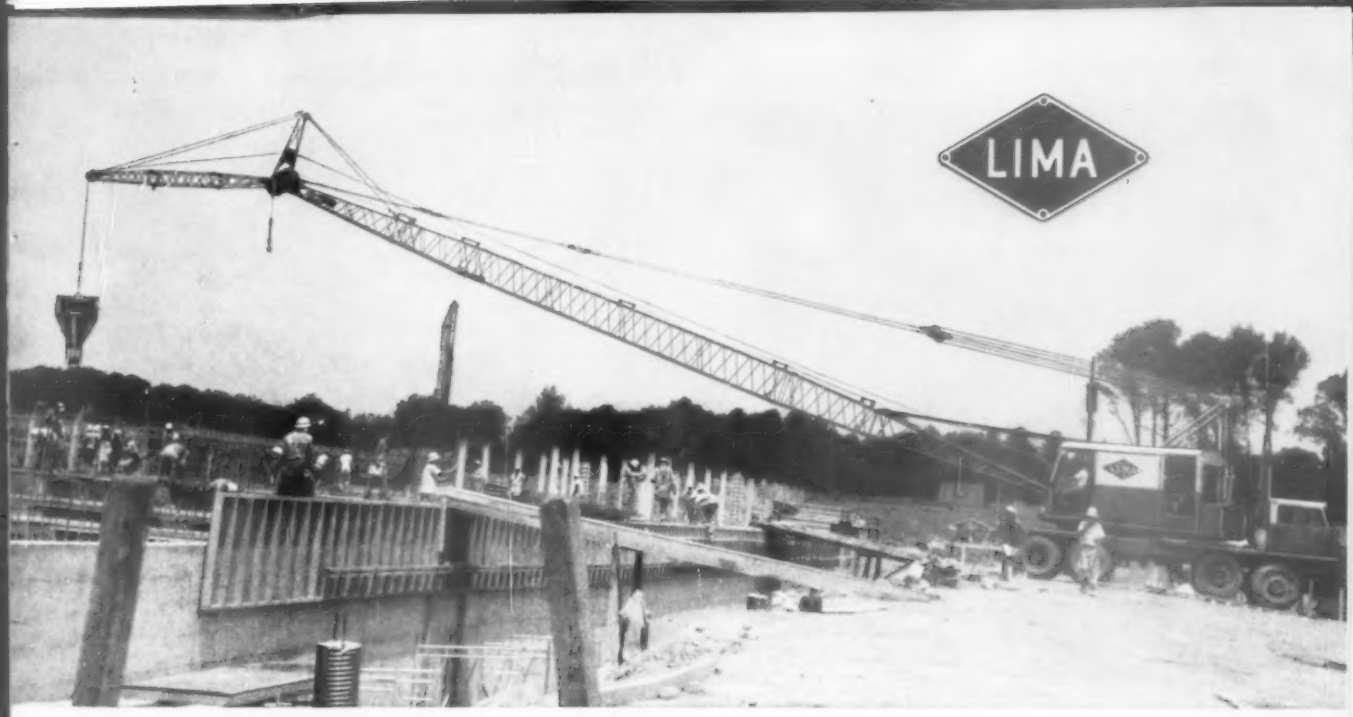
classification zone without the detrimental frictional drag forces of a fixed wall.

By regulating secondary air flow and maintaining constant exhaust air velocity, the primary inlet velocity is regulated and the various aerodynamic forces are controlled to separate fines smaller than a given diameter. The new classifier is recommended for applications in the 200-50 mesh (74 to 297 microns) range. *Buell Engineering Co., Inc., 123 William St., New York, N.Y.*

Enter 240 on Reader Card

(Continued on page 141)

Enter 1319 on Reader Card



New LIMA 64-T Truck Crane with 100′ boom and 30′ jib reaches out almost horizontally to pour concrete on foundation job.

LIMA 64-T . . . new 50-ton truck crane.

New LIMA 64-T Truck Crane combines high capacity, long reach, low weight

The 64-T Truck Crane with 50 ton rated capacity is the latest addition to the long line of dependable, high performance LIMA cranes. The 64-T is completely designed and built, from the ground up, by LIMA. The latest developments in high strength steels are utilized to combine high capacity and long reach, with low weight. The main frame and components of the 64-T carrier is of "T-1" steel (100,000 psi yield strength).

Goes anywhere truck can go

Mounted on 12 heavy duty tires, the LIMA-designed 8 x 4 (rear drive) or 8 x 6 (front and rear drive) carrier will go anywhere a truck can go, on-or-off highway, at speeds up to 25 mph.

The LIMA Type 64-T Truck Crane will raise a 150-ft. boom, plus 30-ft. jib (180′-0″ total), from the ground without auxiliary aid.

Gantry can be lowered to cab height while boom is suspended. Rear counterweight, pin connected front and rear outrigger boxes and beams are easily removed to reduce road weight. Hydraulic power steering, precision air controls and air brakes insure easy operation to reduce operator fatigue and produce top performance.

Versatile LIMA Cranes

LIMA cranes—capacities to 110 tons crawler mounted and 70 tons rubber mounted—are highly versatile. Interchangeable front ends make them adaptable to almost every job; they can be used as cranes, shovels, draglines or pullshovels.

Learn now why LIMAS are the choice everywhere for rugged, dependable performance! See your nearby LIMA distributor or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio

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Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

BALDWIN BLH LIMA-HAMILTON

WESTERN PRECIPITATION'S

NEW THERM-O-FLEX COLLECTOR

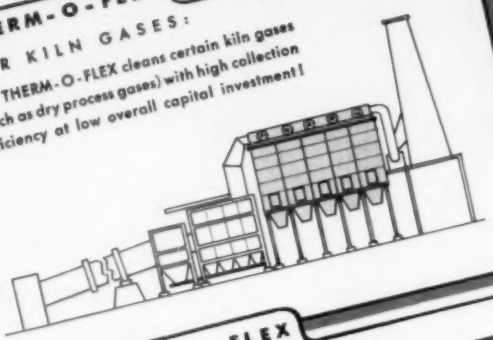
CLEANS GASES TO 550°F

with VIRTUALLY 100% COLLECTION!

THERM-O-FLEX

FOR KILN GASES:

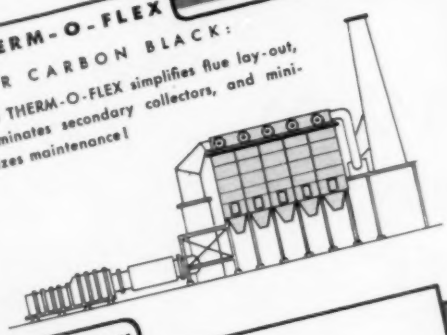
The THERM-O-FLEX cleans certain kiln gases (such as dry process gases) with high collection efficiency at low overall capital investment!



THERM-O-FLEX

FOR CARBON BLACK:

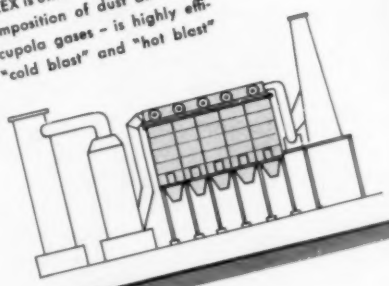
The THERM-O-FLEX simplifies flue lay-out, eliminates secondary collectors, and minimizes maintenance!



THERM-O-FLEX

FOR CUPOLA GASES:

The THERM-O-FLEX is unaffected by the varying chemical composition of dust and fume particles from cupola gases – is highly efficient on both "cold blast" and "hot blast" processes!



Western-Precipitation brings another important new advancement to the gas cleaning field — the THERM-O-FLEX Collector — a filter type of unit with many advantages over conventional filter equipment...

- The THERM-O-FLEX features glass silicone treated filter tubes that efficiently handle gases as hot as 550° F!
- The THERM-O-FLEX tubes are cleaned *automatically* by intermittent collapsing (not by destructive shaking). This assures uniformly low pressure drop combined with long filter life!
- The THERM-O-FLEX has *no moving parts* — nothing to require frequent servicing or replacement!

RESULT — highest collection efficiency combined with lower cost, less maintenance and uniformly low pressure drop on a wide range of applications, a few of which are shown at left.

Let Our Experienced Engineers study your dust or fume collection problem — *large or small* — and show exactly how **THERM-O-FLEX** gives new standards of performance at low installation costs. No obligation, of course!

THERM-O-FLEX literature will gladly be sent. Write or phone, the Western-Precipitation office nearest you.

COTTRELL Electrical Precipitators
MULTICLONE Mechanical Collectors
CMP Combination Units
DUALAIRE Jet-Cleaned Filters
THERM-O-FLEX Hi-Temp Filters
TURBULAIRE-DOYLE Scrubbers
HOLO-FLITE Processors
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Precipitation Company of Canada Ltd., 8285 Mountain Sights Avenue, Montreal 9

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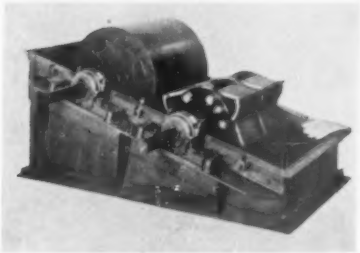
NEW MACHINERY

(Continued from page 138)



Roll crusher-hammermill

THE ROLLHAMMER combines the functions of a roll crusher and a hammermill. According to the manufacturer, the unit crushes practically any material with a minimum of undesirable fines. It can be adjusted to produce any size down to six mesh when operated in closed circuit.

The roll crusher-hammermill principle is said to reduce power consumption. Hammer and roll are driven independently at different speeds. A rubber-lined crusher can be furnished. *O'Brien Industrial Equipment Co., 1569 Hudson Ave., San Francisco 24, California.*

Enter 218 on Reader Card

Crawler tractor

A DIESEL CRAWLER TRACTOR, the TD-15, has a 6-cyl. engine which develops 105 hp. The tractor also has all-weather, push-button, gasoline-conversion starting. Features of the engine include positive valve rotators, pressure-lubricated rocker arm shaft, aluminum alloy pistons, fully counter-balanced crankshaft and twin-plunger injection system.

The new six-speed, single-stick, full-reverse transmission is designed for practical application of all six speed ranges. A shuttle bar control permits instant reverse or forward motion without shifting. With a single lever, an operator can shift the transmission through any of the speed ranges. The shift pattern permits full use of reverse speeds that are approximately 25 percent faster than corresponding forward gears.

Available as optional equipment is a foot decelerator pedal. Greater stability is attained with six-roller track frames and new 1,000-hr., heavy-duty, bushing-type track rollers which lengthen maintenance periods appreciably, the manufacturer claims. *International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.*

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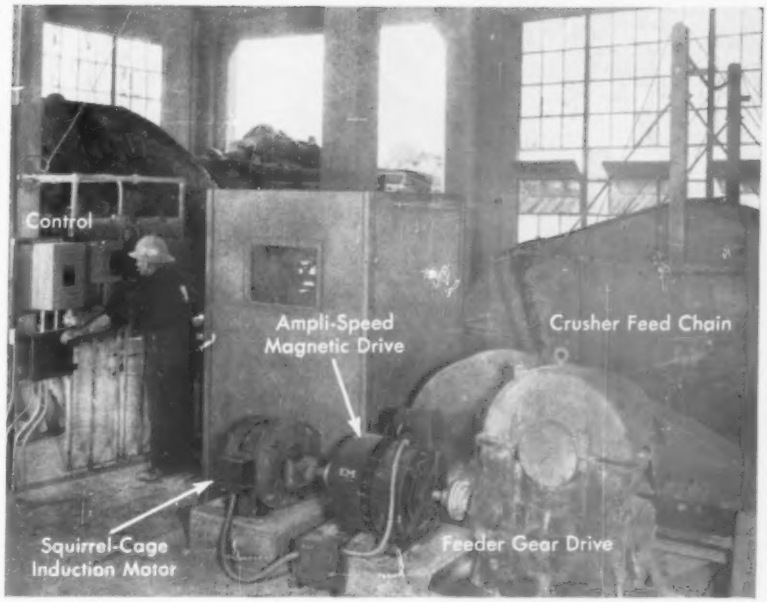
(Continued on page 143)



CEMENT COMPANY STEPS UP CRUSHER OUTPUT 10%

Stops overloading by automating feeders with E-M AMPLI-SPEEDS

PROBLEM: "How to keep hammermill crushers fully loaded without overloading?" That was the problem facing operators of a large midwest cement plant.

Crushers were severely overloaded when heavy concentrations of rock were loaded onto the traveling feed chains a carload at a time. And to make matters worse, the steadily moving feeders kept right on feeding the already overloaded crushers. Yet, *in between* carloads the crushers were underloaded because the wound-rotor motors driving the feed chains were kept at their lowest speed to minimize overloading.

SOLUTION: Mill engineers replaced the wound-rotor motors with 20 hp, 1750 rpm squirrel cage induction motors they had in stock and installed E-M Ampli-Speed Magnetic Drives between the motors and the feeder gear drives. Simple control circuits were devised by putting a current transformer in each crusher motor power circuit and feeding its output through a rectifier to the Ampli-Speed Control.

RESULT: Now when crushers start to overload, motor line current signals the Ampli-Speed to stop the feeder. When the threatened overload passes, crusher motor line current drops and the feeder moves forward. This automatic start-stop action of the E-M Ampli-Speeds keeps the crushers fully loaded but never overloaded. Time saved between carloads by the increased speed of the feed chains has stepped up output 10%.

Do you have a speed control problem? . . . Ask your nearby E-M speed control expert for help. He will be glad to give you details about precise, adjustable control with Ampli-Speed. Also, write the factory today for Bulletin No. 1140-RP.

Somewhere in your plant an operation can be improved with smooth, adjustable speed control . . .

DO IT YOURSELF WITH AMPLI-SPEED

E-M 4400-TPA-2211

ELECTRIC MACHINERY MFG. COMPANY

Minneapolis 13, Minnesota

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SYMONS®

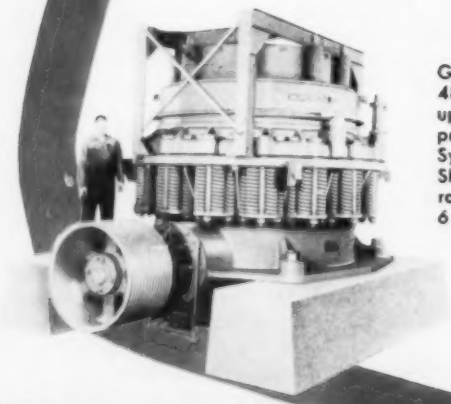
GYRATORY and CONE CRUSHERS for low cost-big capacity Primary and Fine Reduction Crushing

• For increased productivity at lower ton-hour crushing cost of ores, industrial minerals, cement and rock products . . . think first of Symons Gyratory and Cone Crushers—choice of the world's leading producers.

The most important reason behind this preference for Symons is the fact that these soundly engineered, heavy duty crushers produce more material to desired specifications, use less power, give maximum life of crushing members and, in most cases, require less operating personnel.

Nordberg welcomes your inquiry and the opportunity to work with you in helping to solve your specific crushing problems. A copy of Bulletin 247 will gladly be sent upon request.

NORDBERG MFG. CO., Milwaukee 1, Wis.



For heavy duty primary breaking, Symons Gyratory Crushers are available in 30", 42", 48", 54", 60" and 72" sizes, for capacities up to 3500 and more tons per hour. For primary, secondary and finer reductions, Symons Cone Crushers, in Standard and Short Head types, are available in sizes ranging from 22" to 7'—in capacities from 6 to 900 or more tons per hour.

SYMONS . . . a registered Nordberg trademark known throughout the world.

NORDBERG MACHINERY

NORDBERG

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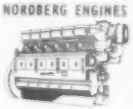

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NEW MACHINERY

(Continued from page 141)

Belt conveyor idlers

AN EXPANDED NEW LINE of belt conveyor idlers is offered in five series and in widths ranging from 14 to 84 in. In all, the new line includes more than 630 different types and sizes.

The five series of idlers, designated as Series 5000 through 9000, make possible the matching of idlers to specific operating requirements. A wide range of idler types is available in most series. In addition to flat, 20-deg. and 45-deg. troughed idlers, others include rubber cushioned idlers for use at loading points, positive action and actuating disc training idlers, and variable troughed idlers.

All five of the new idler series feature inverted angle bases. Removable steel retainer clips at each bracket hold rolls in position. *Link-Belt Co., Prudential Plaza, Chicago 1, Ill.*

Enter 220 on Reader Card

Blast-hole drill

THE DRILLMASTER is now available with a new mounting. Set-up time for the unit, called the TRUCM-3 Drillmaster, is only a few minutes because the drill tower is raised and lowered by hydraulic power. This drill, which follows its steel right down the hole, has been known to drill 350 ft. of hole during a single 8-hour shift. Further, it can be used as a heavy-duty rotary unit when soft, non-abrasive overburden and bedrock must be worked.

The carrier-mounted unit can travel at sustained highway speeds and meets legal requirements in all states of the U. S. Its mounting was designed by Crane Carrier Corp. *Ingersoll-Rand, 11 Broadway, New York 4, N.Y.*

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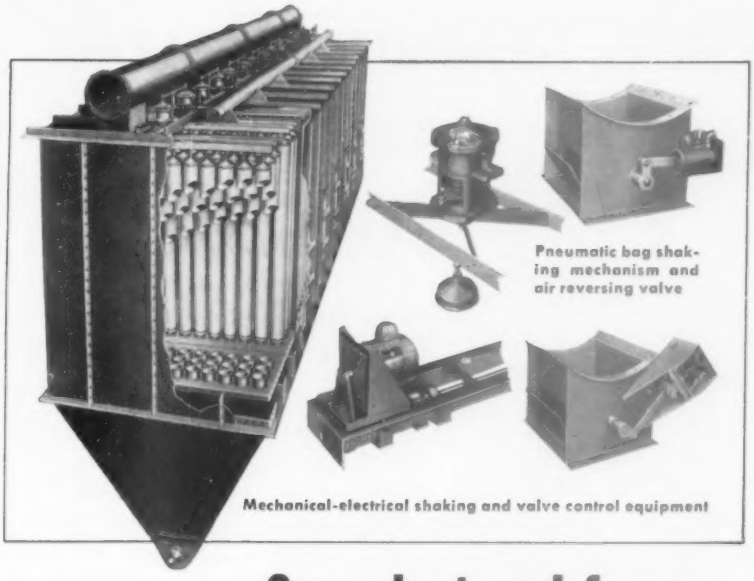

...Cure dust and fume air pollution with the

Norblo FULLY AUTOMATIC Collection System

Whether your need is for a moderate amount of dust collection or a large scale 24 hour-a-day operation, a Norblo System will give you efficient performance at economical cost. It practically runs itself; supervision is easy — maintenance very low.

The full capacity of equipment designed for you is maintained by a number of Norblo features, most important of which is the cyclic bag cleaning or shaking action. Controlled by a highly efficient timing system, the cleaning involves only one bag compartment at a time — for a few seconds only — with no variation in capacity.

Motive power for bag shaking and air reversing valve operation can be either pneumatic or mechanical-electrical. The former is usually more economical where an ample supply of compressed air exists. The mechanical type, actuated by electric motors and duplicating the pneumatic operation, is particularly valuable for outdoor installations where compressed air lines might freeze; or for isolated locations of the equipment where compressed air is not available.

Send a description of your air pollution problem. Let Norblo engineers suggest the best solution. Or write for Bulletin 164.

The Northern Blower Company
6408 Barberton Ave., Cleveland 2, Ohio • OLympic 1-1300

Norblo ENGINEERED DUST COLLECTION SYSTEMS FOR ALL INDUSTRIES

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MORE ECONOMICAL BREAKAGE

WITH THE **"CAPE ANN"**

FORGED STEEL DROP BALL

HIGHLY EFFICIENT SECONDARY BREAKAGE MEANS—MORE TONNAGE—MORE PROFITS

The "Cape Ann" Forged Steel Drop Ball is noted for its long life and better wearing qualities for use in secondary breakage. It is "TOPS" in the drop ball field where constant pounding day in and day out make it absolutely necessary that ruggedness and dependability be the key factor to insure maximum production.

WRITE FOR PRICES AND INFORMATION

2000 TO 12000 LBS.

CAPE ANN ANCHOR & FORGE CO.
Post Office Box 360 Gloucester, Mass.

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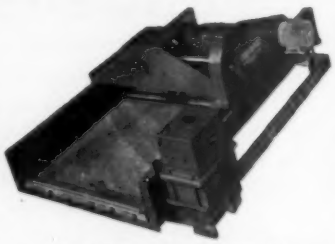
First in the Screening of Difficult, Damp Materials

For the screening of very difficult, fine mesh, damp materials such as ag-lime or silica sand, there is nothing to match the Leahy® No-Blind® Vibrating Screen.

- Differential Vibration clears the mesh of wedging particles.
- FlexElex® heating keeps mesh dry and wide open.
- Straight runs of oversize bus bars completely eliminate bothersome flexible transformer connectors.

Send for Bulletin 16-EH.



Made by the Original Deister Co. *Incorporated 1906*

The DEISTER CONCENTRATOR COMPANY, INC.
915 Glasgow Avenue Fort Wayne, Indiana

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WHAT ARE YOU PAYING FOR REPAIRS?

The money you are paying to keep worn-out equipment working may be just enough for you to own better equipment.

See the **"WHERE TO BUY"** *Section*

NEW MACHINERY

(Continued from preceding page)

Detachable container system

DETACHABLE CONTAINERS with capacities to 40 cu. yd. are designed to handle all types of materials and 30,000-lb. net payloads. A hoist is mounted to either a single-axle or tandem-axle truck. A single lever, mounted on the dashboard inside the cab, enables the truck driver to pick up, haul, dump or drop off any number of detachable containers. The unit is powered entirely by hydraulics.

"Huge Haul" containers are available open or closed. They range in sizes from a flat bed to 10, 15, 20, 25, and 30-cu. yd. standard units. Special containers are available to 40-cu. yd. capacities. All closed containers are equipped with two top charging doors that open to expose an unobstructed charging area of 70½ x 177 in. Containers are tapered to give a wider opening at the rear discharge area for clean, complete dumping. *Ingersoll Kalamazoo Division, Borg-Warner Corp., 1810 N. Pitcher St., Kalamazoo, Mich.*

Enter 236 on Reader Card

Four wheel scraper

DESIGNED FOR SMALLER projects, for self-loading jobs and for clean-up or finishing work, is the newly introduced "Michigan" Model 110. Capacity of this 4-wheel scraper is 8 cu. yd. struck, 10½ cu. yd. heaped. Teamed with other equipment, the Model 110 offers all-hydraulic control to actuate hydraulic cylinders operating the hoist, apron and ejector. The scraper's cutting edge consists of four interchangeable and reversible sections.

When drawn by a Michigan Model 180 tractor dozer, it can travel at speeds up to 27 mph. The four-wheel scraper is 27 ft. long, 8½ ft. wide and 9½ ft. high. Empty weight is 14,450 lb.; fully loaded, 40,450 lb. It runs on four wide-base tubeless tires. Rear wheel air brakes are optional. *Construction Machinery Division, Clark Equipment Co., P.O. Box 599, Benton Harbor, Mich.*

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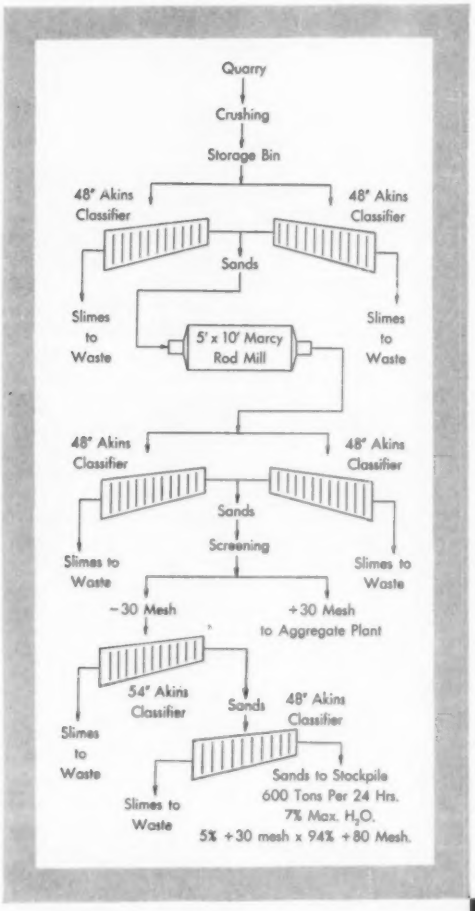

20 years of efficient classification by AKINS ...grinding by MARCY

Deckers Creek Sand Co.

This prominent producer of silica sand, near Masontown, West Virginia, first installed three Akins Classifiers in 1938. A Marcy Rod Mill and three additional Akins Classifiers were later installed to improve the product and enable the company to progress even further in this industry.

Manufacturing Division

THE MINE AND SMELTER SUPPLY CO.

DENVER 16	NEW YORK 17	SALT LAKE CITY 1	EL PASO
3800 RACE STREET	122 E. 42nd STREET	121 W. 2nd S.	P. O. BOX 1162

Licensed Manufacturers and Sales Agents in Canada, Australia, Sweden, England, South Africa
Sales Agents in Peru, Chile, Philippine Islands, Japan, New York City (for Continental Europe) and in principal cities of the United States.

For an efficient classification and grinding combination get
AKINS • MARCY

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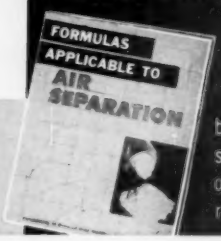
USING SCREEN SEPARATIONS?
NOTHING CLASSIFIES AS
PERFECTLY AS AIR

GAYCO
CENTRIFUGAL
AIR
SEPARATORS

Classify practically all dry fine materials

You get:
- CLOSER SEPARATIONS
- IMPROVED PRODUCTION
- NO UNDESIRABLE OVERSIZE.

RANGE 60 to 400 mesh.
Timken bearings.
Choice of Standard or Heavy-Duty Models.



this helpful booklet sent on request

Robert M. Gay Division
UNIVERSAL ROAD MACHINERY CO.
117 Liberty St., New York 6, N. Y.
Factory and Laboratory: Kingston, N. Y.
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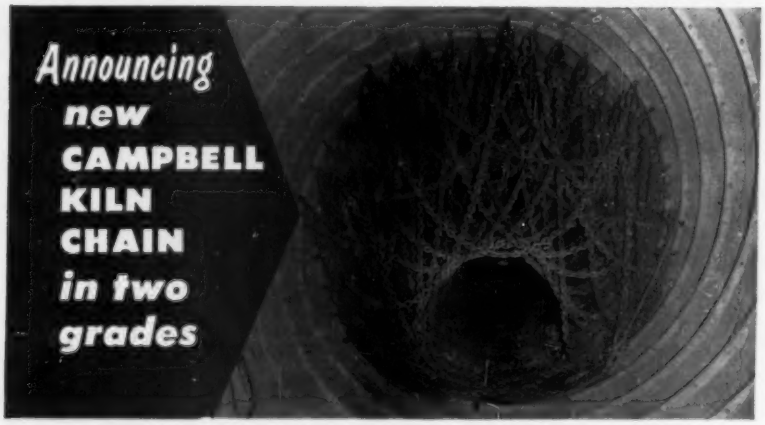

Carbon Steel . . . and New Thermal-Abrasive Resistant No. 7

Now, Campbell Kiln Chain is available in two types of material and in Proof Coil, BBB or Passing Link styles. Campbell Kiln Chain can be supplied to fit any chain system currently in use, and Campbell components for attaching chain within the kiln can be supplied to the same physical specifications as the chain desired. For details contact your Campbell representative, or write the Engineering Division in York, Pa.

CAMPBELL CHAIN

Campbell also manufactures a complete line of chain for all phases of the mining industry.

CAMPBELL CHAIN Company
York, Pa.—West Burlington, Iowa • East Cambridge, Mass., Chicago, Ill.
Portland, Ore., Seattle, Wash., Los Angeles, Sacramento, San Francisco, Calif.
Makers of Jiffy Lug-Reinforced Tire Chains and Blue Temper pre-cut, packaged chain

Enter 1306 on Reader Card

NEW MACHINERY

(Continued from page 144)

Electrical trouble detector

AN IMPROVED ELECTRICAL trouble-shooter is now available—a pocket-size, combination volt-ohm-mil-ammeter that is said to quickly and accurately trace the cause of most electrical failures. With this instrument users can check machine wiring, panel boxes, motors and everything electrical. It takes the guesswork out of locating broken wires, poor contacts, loose connections and low voltages in either ac. or dc. and can help determine the efficiency of fuses, circuit breakers and other electrical equipment. According to the manufacturer, it will eliminate expensive electrical service calls, doing away with the tedious method of locating electrical faults by the elimination or isolation of circuits. *Bergen Machine & Tool Co., Inc., 189 Franklin Ave., Nutley 10, New Jersey.*

Enter 222 on Reader Card

Plastic respirator

A PLASTIC RESPIRATOR for protection against dusts, pneumoconiosis-producing mists and chromic acid mists weighs only 2.1 oz. The Air-Raider, with Bureau of Mines Approval 2175, introduces a respirator design providing a greater functioning filter area which is said to increase filter life. Valve construction and location reduce inhalation and exhalation resistance. The modified polyethylene material is described as nontoxic, resilient and durable.

The frame cushion-fits a wide variety of face shapes and head sizes. Double headbands have four-point suspension, providing a positive seal with minimum pressure. Filter is a treated-wool electrostatic type. *Welsh Mfg. Co., 62 Magnolia St., Providence 9, R.I.*

Enter 223 on Reader Card

Control valve

A VALVE—Model C—is designed for responsive control and is especially suited to abrasive and corrosive slurries. A cast steel, two-piece housing jackets a full-length, 1-in.-thick gum rubber or neoprene sleeve liner. Plant air controls the laminar flow through the Venturi orifice. The unit is presently available in 1½, 2, 3 and 4-in. sizes (full diameter). *The Clarkson Co., 564 Market St., San Francisco 4, Calif.*

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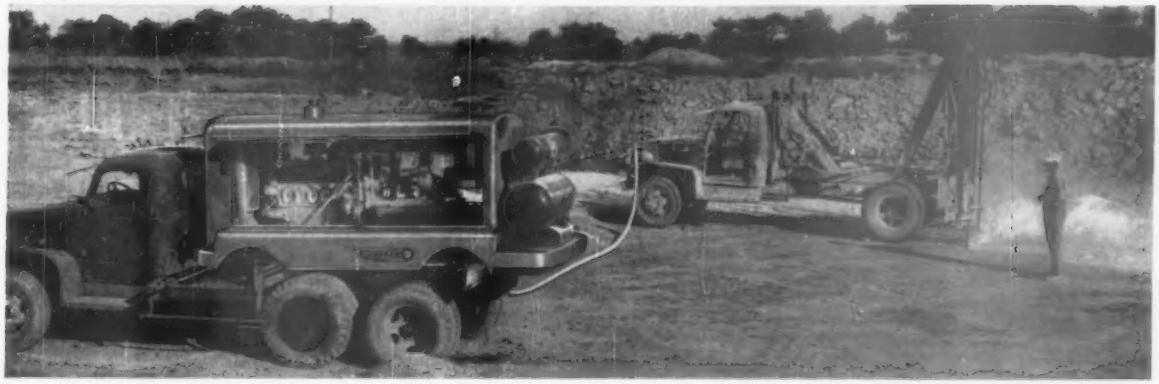
END

Logging 500' per shift in limestone with low cost Jaeger air.



Jaeger "600" and dual drill rig, both truck mounted, handle several locations.

Track drills and readily truck mounted Jaeger rotaries make mobile "teams."

Only Jaeger gives you 600 cfm @ 1650 rpm

Using the same GM 6-71 diesel engine as all other "600" rotaries, your Jaeger gives you full rated capacity at 150 rpm slower speed (1650 instead of 1800). In 8 hours full load operation that totals 72,000 fewer revolutions, saving miles of engine piston travel and pounds of fuel.

Because all operation is below the continuous horsepower curve, engine maintenance is at a minimum. As for the compressor unit itself, many Jaeger rotaries have logged more than 8000 hours without requiring the replacement of a single vane.

125, 250 and 365 cfm models are comparable (1700 rpm full load speed instead of 1800 up). The difference puts money in your pocket. Ask any Jaeger user — or ask us for Catalog JC-7.

THE JAEGER MACHINE COMPANY

603 Dublin Avenue, Columbus 16, Ohio

Jaeger Machine Company of Canada, Ltd., St. Thomas, Ontario

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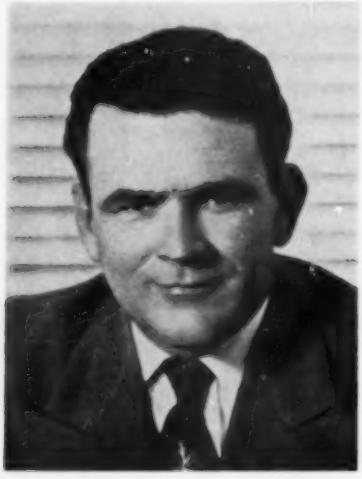
MANUFACTURERS NEWS

New Hyster plant at Danville goes into operation

FULL PRODUCTION ACTIVITIES are now underway at the new Hyster Co. plant at Danville, Ill. The plant is located on the outskirts of Danville on a fifty-five acre tract and is about two and one-half miles from Hyster's original factory in Danville which has remained in operation. The building is 200 x 500 ft. and is the first of three wings to be built. It houses, at present, a completely mechanized assembly line, a mechanized shipping department, service parts storage and handling department and a receiving department.



Failing named special field agent

MOBILE DRILLING, INC., Indianapolis, Ind., has announced the appointment of Jay C. Failing as chief sales representative for a new line of rotary earth-drilling equipment designed under his direction and scheduled for production by the company. Mr. Failing was formerly with the George E. Failing Supply Co. as exclusive sales representative for the western United States and Mexico.

Du Pont transfers sales headquarters

E. I. DU PONT DE NEMOURS & CO., Wilmington, Del., has announced the transfer of the company's Pacific Coast district sales headquarters for its nitrogen products from San Francisco to Los Angeles. Marion N. Crady will continue as district manager; Dexter M. Thompson and Lawrence J. Munzenmaier will continue as sales representatives.

Representative for Arcair

SEYMOUR BECKER has been appointed field representative in the New England states for the Arcair Co., Lancaster, Ohio. Mr. Becker has been associated with the welding industry through experience in welding sales and as a welding instructor.

Bucyrus-Erie promotes Black

LEWIS C. BLACK has been appointed manager of domestic sales by the Bucyrus-Erie Co., South Milwaukee, Wis. Mr. Black had been manager of sales for large excavators since January, 1958, and had previously served as assistant general sales manager of large machines and blast hole drills.

Davidson appointed assistant sales manager

HERB J. HAWTHORNE, INC., Houston, Texas, has announced the appointment of W. A. Davidson as assistant sales manager. Mr. Davidson joined the Hawthorne sales staff as a sales representative in February, following eleven years' association with a major oil industry supply firm. He had served as division manager for West Texas-New Mexico, and more recently as division manager in charge of industrial sales for the Houston area, before joining Hawthorne.

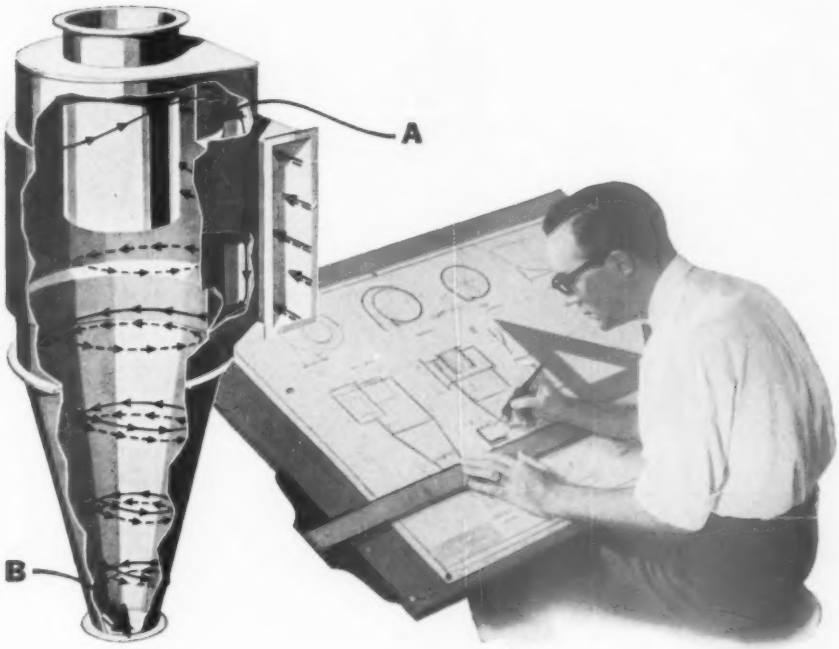
Clark appoints Hart Washington representative

CLARK EQUIPMENT CO., Buchanan, Mich., has announced the appointment of Jack B. Hart as Washington representative of the Construction Machinery Division. Mr. Hart will represent the company in negotiating government business and federal contracts. Mr. Hart has been with the company nearly 12 years and had been export manager until 1956, when he was appointed sales manager for Clark Equipment International, C.A., a subsidiary.

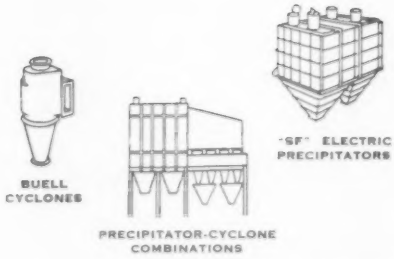
New Leschen movie

LESCHEN WIRE ROPE DIVISION, H. K. Porter Co., Inc., New York, N.Y., has made available a 22½ min., color-sound movie entitled "The Red-

(Continued on page 150)



The most efficient operating cyclone collectors made



Design makes the difference: in over a thousand plants across the continent, Buell Cyclones have *proved* themselves more efficient than any other cyclones made. Buell's exclusive Shave-off port (A), traps the extra percentage of dust that ordinary cyclones lose. And large-diameter, (B), custom-engineered design eliminates bridging, clogging, or plugging during operation, keeps efficiency high without interruption. Regardless of your present or planned plant layout, Buell equipment can be designed to solve your dust collection problems efficiently and economically. There's valuable information in a concise booklet, "The Exclusive Buell Cyclone". Write Dept. 17-L, Buell Engineering Company, Inc., 123 William Street, New York 38, N. Y.

Buell Cyclones before installation at a major plant.

buell®

Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**

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MANUFACTURERS NEWS

(Continued from page 148)

Strand" showing the process of producing finished wire from rod, going through the steps of patenting, cleaning, coating, drawing and spooling. Featured is an explanation of the many tests that are made in Leschen's laboratories of Red-Strand wire rope and prestressing strand. Arrangements for showings of the movie may be made by writing to Advertising Dept., Leschen Wire Rope Div., H. K. Porter Co., Inc., 2727 Hamilton Ave., St. Louis 12, Mo.

New Hobart school

HOBART BROTHERS Co. has announced the opening of the Hobart Brothers Technical School in Troy, Ohio, devoted to teaching, research and development in the welding field. Howard B. Cary has been appointed director of the school. Mr. Cary has resigned his position as assistant general works manager of the Marion Power Shovel Co.

Douglass heads new marketing division

THE THEW SHOVEL Co., Lorain, Ohio, has announced the formation of a marketing division for its Lorain power shovels and cranes and Moto-Loader line of front end loaders. D. L. Douglass, in the newly-created position of director of marketing, has been appointed to administer the division.

M. B. Garber is resigning his post as director of sales and this title will be discontinued. He remains as vice president and as a director of the company and will function as a marketing consultant.

J. L. Beltz, formerly director of sales promotion, has been named manager of the marketing staff and J. F. Beles has been appointed manager, parts and service. C. S. Weber was named advertising and sales promotion manager; O. J. Winsor has been appointed product development manager and Lou Radakovich moves from parts sales to training manager.

Airco appointees

AIR REDUCTION SALES Co., a division of Air Reduction Co., Inc., New York, N.Y., has announced the appointment of Fred T. Wilson Jr., manager at New Orleans. E. C. Kennedy succeeds Mr. Wilson as assistant manager-sales, New Orleans.

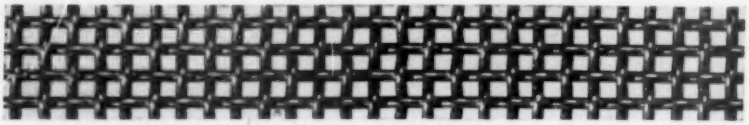
Mr. Wilson joined Airco in 1947 and served in various sales capacities at Louisville, Ky., and Nashville, Tenn. Mr. Kennedy has been with Airco for six years and previously was a salesman at Shreveport, La., and Mobile, Ala.

Mairs appointed manager

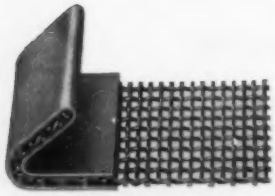
JOY MANUFACTURING Co., Pittsburgh, Pa., has announced the appointment of M. Bruce Mairs as product manager of the newly created minerals dressing department, Mining and Construction Division. Mr. Mairs served for the past two years as district manager of the Montreal branch of Joy Manufacturing Co. Ltd. He has also served as branch manager of Vancouver and as salesman in various Canadian territories.

Also at Joy, a newly established Boston branch office has been opened at Burlington, Mass. D. L. Archibald, industrial division district manager, established the new location to better serve the New England states.

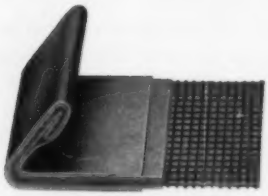
(Continued on page 153)



TYLER SCREENS LAST LONGER



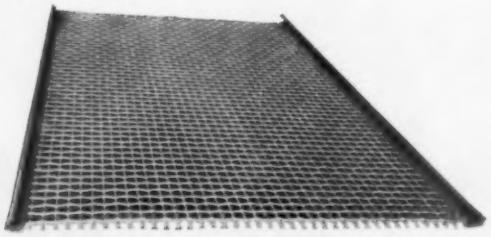
Tyler Type "AX" Hook Strip. For wire diameters from .047" to 5/16" inclusive.



Tyler Type "CX" Hook Strip. For wire diameters .041" and smaller.

Tyler Woven Wire Screens are woven with laboratory approved wires on precision machines. The high quality of Tyler Screens is apparent in their long life and service under the most difficult of screening conditions.

Tyler Screen Sections are furnished for all makes of vibrating screens in all meshes and metals. Each section is fabricated with the right type of edge or hook strip for the specification of screen cloth and to fit the particular make and model of screening machine on which it will be used.



Telephone **HE 1-5400** • *Teletype* **CV 586**

THE W. S. TYLER COMPANY

CLEVELAND 14, OHIO

Manufacturers of Woven Wire Screens and Screening Machinery

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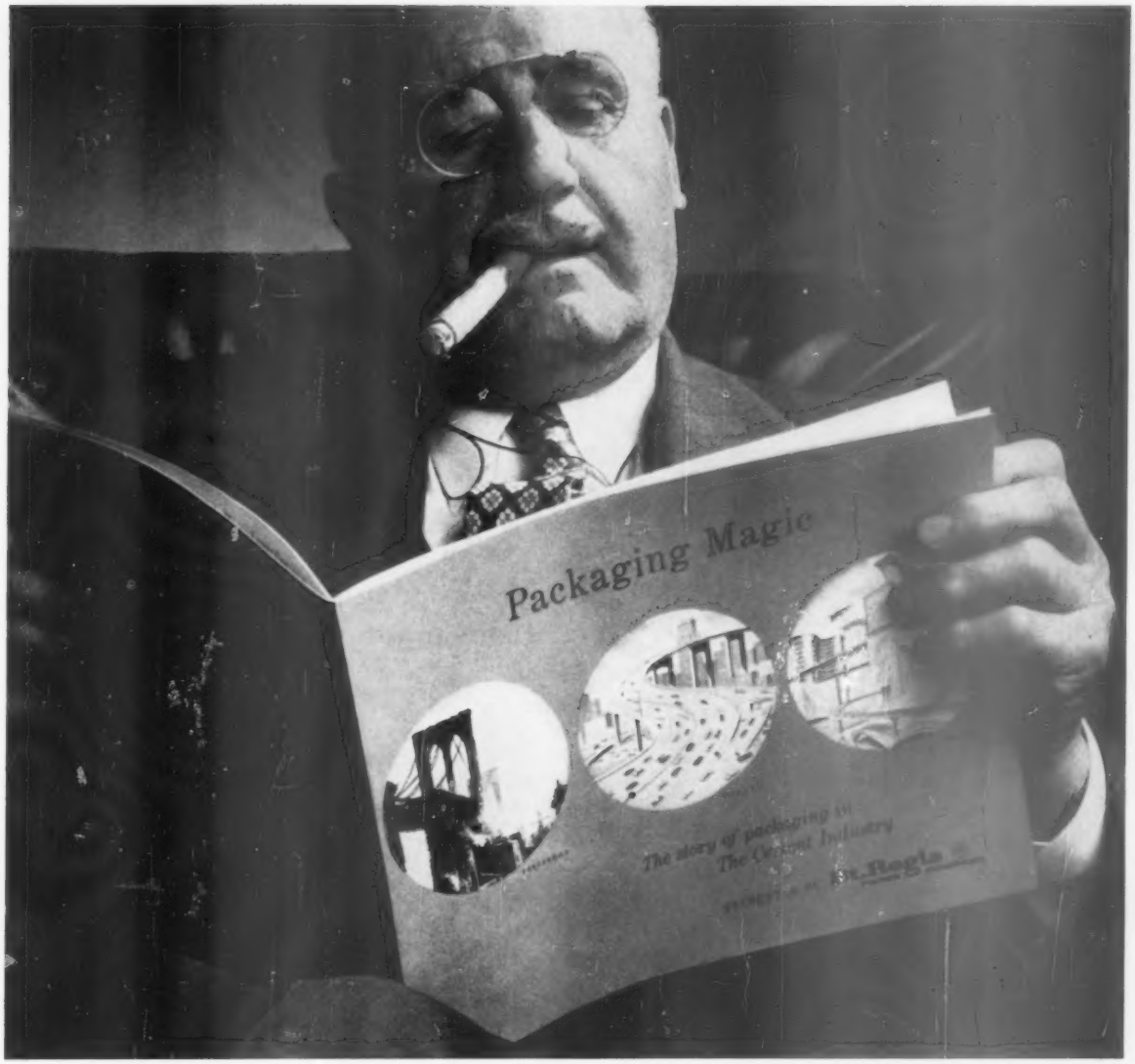

Required Reading

If you're interested in the packaging of cement, you'll want to read "*Packaging Magic*"—the new booklet that's now available for the asking. St. Regis—pioneer in packaging progress for the cement industry—prepared this interesting, fast-moving, illustrated book with the help of many leading cement producers.

In its pages, you'll find the complete story of cement packaging—past, present and future. You'll learn interesting facts from the old days. You'll see how cleaner bags and closer weight control became today's reality. And you'll find the marvels of packaging St. Regis is planning to bring you tomorrow.

We know you'll find this new booklet "required reading." For your copy, write today to Multiwall Packaging Division, St. Regis Paper Company, Dept. RP-1258, 150 East 42nd Street, New York 17, New York.

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St.Regis PAPER COMPANY

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new name for the "toughness champ" multiwall made from Clupak* paper

Fertilizer, feed, cement, chemicals, seed, produce—everything that travels in a multiwall travels *safer* in a WONDERWALL.

This superiority has been proven in the lab and in the field. WONDERWALL bags perform better because they're made of tougher Clupak paper—the paper that stretches. It absorbs impact without failing where ordinary kraft paper breaks.

WONDERWALL bags measurably *reduce breakage.* Also, they pack faster, handle easier, stack firmly . . . and they cost no more than old-fashioned bags.

For better efficiency and lower costs specify WONDERWALL, the bag that's making ordinary multiwalls obsolete. On your next carload, order a trial shipment of 5000 and see for yourself.

**Clupak, Inc.'s trademark for extensible paper manufactured under its authority.*

MULTIWALL BAG DIVISION

WEST VIRGINIA PULP AND PAPER COMPANY

230 Park Avenue, New York 17, N. Y.

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MANUFACTURERS NEWS

(Continued from page 150)

Torrington appoints district office managers

THE TORRINGTON CO., Torrington, Conn., has announced the re-assignment of certain district engineers for the Bearing Divisions. E. G. Rowlett has been assigned to the Los Angeles office as manager, replacing J. H. Williams who became assistant to the sales manager of the Bantam Bearings Division, South Bend, Ind. John Heyvaert has been promoted from the Milwaukee office to district engineer, Davenport, Iowa, replacing Mr. Rowlett. Ron Peterson and Norman Cook have been assigned to the Milwaukee and Pittsburgh offices, respectively.

Reich named vice president

DAVID REICH has been named vice president of Marion Power Shovel Co., Marion, Ohio. Mr. Reich joined the organization in 1956 and advanced to assistant to the president. In his new position he will continue to be responsible for industrial and public relations, advertising, purchasing, office service and systems and cost control.

Byers appointee

A. M. BYERS CO., Pittsburgh, Pa., has announced the appointment of Robert J. Heister as manager of the Pittsburgh division. Mr. Heister has been with the company since 1948.

Atlas Powder representative

DALE A. MACDONALD has been appointed sales representative, San Francisco explosives sales district, for Atlas Powder Co., Wilmington, Del. Mr. MacDonald has been a technical representative in the company's explosives sales department in Wilmington since return from military service.

Also at Atlas, a "Good Neighbor Day" program took place in Joplin, Mo., during September. Community leaders in the area saluted completion of a $4-million expansion and modernization program at the explosives plant.

Link-Belt promotions

LINK-BELT SPEEDER CORP., Chicago, Ill., has announced the promotion of two men to new sales managerial positions. N. V. Chehak has been named sales manager in charge of all domestic and Canadian sales for the company's line of crawler and rubber-tired shovel-cranes and the related diesel pile hammer equipment. D. F. Van de Roovaart assumes the duties of assistant sales manager for U. S. and Canadian territories.

Mr. Chehak joined the company in 1948. In 1955 he was appointed to the post of assistant sales manager. Mr. Van de Roovaart joined the firm in 1936 and has served as assistant sales manager for western U. S. and Canada since 1957. **END**

RP BUYER RESEARCH SERVICE

PRODUCER PURCHASING SERVICE *FREE*

QUICK—COMPLETE SOURCE CONTACTS FOR ROCK PRODUCTS PRODUCERS on Machinery—Equipment—Supplies—Service

___Aftercoolers, Air
___Agitators
___Aggregates (special)
___Air Compressors
___Asphalt Mixing Plants
___Bagging Machines
___Bags
___Barges
___Belting, Conveyor Elevator, Power Transmission
___Belting, V-type
___Belt Repair Equipment
___Bin Level Indicators
___Bins and Batching Equipment
___Bits
___Blasting Supplies
___Bodies, Trailer
___Buckets
___Bulldozers
___Cars, Industrial
___Classifiers
___Clutches
___Coal Pulverizing Equipment
___Concentrating Tables
___Conveyors
___Crushers
___Coolers
___Cranes
___Derricks
___Dewatering Equipment, Sand
___Diesel Engines
___Dragline Cableway Excavators
___Draglines
___Dredge Pumps
___Drilling Accessories
___Drills
___Dryers
___Dump Bodies
___Dust Collecting Equipment & Supplies
___Electric Motors
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___Explosives & Dynamite
___Fans and Blowers
___Feeders
___Fifth Wheel Heavy Duty Special
___Flotation Equipment
___Front End Loaders
___Gasoline Engines
___Gear Reducers
___Generator Sets
___Grinding Media
___Gypsum Plant Machinery
___Hard Surfacing Materials
___Hoists
___Hoppers
___Kilns: Rotary, Shaft, Vertical
___Locomotives
___Lubricants
___Magnetic Separators
___Mills
___Pipe
___Pumps
___Scales
___Screen Cloth
___Screens
___Scrubbers: Crushed Stone, Gravel
___Shovels, Power
___Speed Reducers
___Tanks, Storage
___Tires and Tubes
___Torque Convertors
___Tractor Shovels
___Tractors
___Trailer Dump Bodies
___Trucks, Bulk Cement
___Trucks, Industrial
___Trucks, Mixer Body
___Trucks, Motor
___Valves
___Vibrators
___Welding and Cutting Equipment
___Winches
___Wire Cloth
___Wire Rope

If equipment you are in market for is not listed above, write it in space below.

The principal rock product(s) manufactured by my company is/are indicated "1", "2", "3", in order of importance below.
___Crushed Stone
___Sand & Gravel
___Slag
___Cement
___Lime
___Gypsum
___Ready Mix Concrete
___Concrete Products Type_____
Other nonmetallic mineral (What?)_____
All above information is strictly confidential to be used to guide the manufacturers in supplying proper information.

Please Check Service Desired
☐ Have Salesman Call ☐ Literature only
☐ Prices ☐ By mail ☐ Urgent

NOTE: See—Where to Buy-Classified Advertising Section for used equipment and complete plant information

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Title_____
Firm_____
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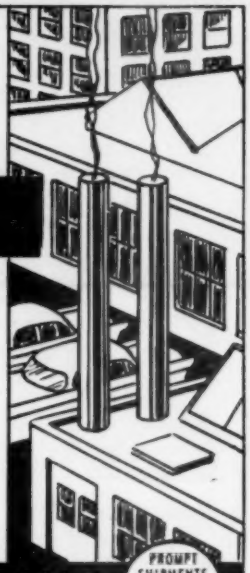

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RUBBER HOSE

Air	Discharge	Suction
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Paint Spray	Fuel Oil	Steam
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Conveyor	Grader	Hot Material	V-Belts
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FOR SALE
GOOD USED EQUIPMENT

650-B Bucyrus Erie Elec. Drag, 195', 16 yd.
15-W Bucyrus-Erie Elec. Drag, 215', 13 yd.
9-W Bucyrus Erie Diesel Drag, 175', 13 yd.
7400 Marion Elec. Drag, 160', 13 yd.
625 Page Diesel Drag, 150', 10 yd.
723 Page Diesel Drag, 130', 10 yd.
621-S Page Diesel Drag, 125', 7 yd.
200-W Bucyrus Erie Diesel Drag, 125', 6 yd.
7-W Bucyrus Erie Diesel Drag, 180', 5 yd.
5-W Bucyrus Erie Diesel Drag, 100', 6 yd.
2400 Lima Dragline, 130', 5 yd.
4500 Manitowoc Drag, 120', 5 yd.
88-B Bucyrus Erie Drag, 90', 4½ yd.
111-M Marion Drag, 80', 4 yd.
1055 P&H Dragline, 80', 3½ yd.
3900 Manitowoc Speedcrane, 100' boom
5560 Marion 26 yd. Elec. Shovel
750-B Bucyrus Erie 20 yd. Elec. Shovel
5480 Marion 18 yd. Elec. H. L. Shovel
170-B Bucyrur Erie 6½ yd. Elec. Shovel
120-B Bucyrus Erie 4 yd. Elec. Shovel
4500 Manitowoc 5 yd. H. L. Shovel
111-M Marion Standard & H.L. Shovels
3500 Manitowoc H.L. & Standard Shovels
54-B Bucyrus Erie H.L. & Standard Shovels
Large selection of smaller Shovels and Draglines available
Model T-750 Reich Truck Mounted Rotary and Down-the-Hole Drill
McCarthy & Compton Coal Auger Drills
Euclid Trucks, Truck Cranes, Dozers, Scrapers, Front End Loaders

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PRICES SLASHED
CRANES & SHOVELS

Bantam "M-49" Used ⅝ dy. Trench Hoe, mounted on International 6x6.
Quick-Way "E" Used 4/10 yd. Trench Hoe or Dragline, mounted on GMC 6x4 truck.
Lorain "TL-25K" ⅝ yd. Crane or Dragline, Cat D315 power, 1951 model. Will rent.
Lorain "TL-20" ½ yd. Trench Hoe, Crane, or Shovel.
P&H "105" ½ yd. Trench Hoe, mounted Zelignon Carrier.
Koehring "304" ¾ yd. Diesel Shovel, GM power, 24" tracks, 12'0" crawlers.
Insley Used Trench Hoe Attachment, for K-12, adapted from Unit attachment. Cheap.
Sargent New 25' Crane Boom for "38" or "410". Discounted.

FRONT END LOADERS

Terratrac "500" Used Crawler Tractor-Shovel, hyd. controlled.
I-H "I-9" R.T. Gas Tractor w/Hyd. Front End Loader.
Ford R.T. Ind. Tractor w/Dearborn Front End Loader.
Barber-Greene "552" Crawler-Mounted Bucket Loader.

TRANSIT MIXERS

Rex 3 Yd. Hi-Discharge (4¼ yd. Agitator) like new on International RF172 Tandem.
Jaeger 3 Yd. Hi-Discharge (4¼ yd. Agitator) repaired, blasted & painted. Mounted Chevrolet tandem truck.
Smith 3 Yd. Hi-Discharge (4¼ yd. Agitator) mounted Chevrolet tandem axle truck, low priced.
Jaeger 2 Yd. Hi-Discharge, priced so low you can buy it for parts. Make offer.
Rex 2 Yd. Hi-Discharge, blasted, steamed & painted. Make offer.

MISCELLANEOUS

Jahn "THL-420" Used 20-Ton Flat Deck Low Boy.
Rogers Used 15-Ton Drop Deck Trailer.
Owen ½ Yd. Used Clamshell Bucket.
Universal "916" R. B. Jaw Crusher*.
Universal 880 Jr. "B" Port. Gravel Crushing Plant, tandems in rear, M-M gas power, sand ejector.

NOTE: All this equipment located in our yard except (*). Some of this equipment can be rented. Terms!

120 S. Pierpont — Phone 4-6706

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DONORA ZINC WORKS
DONORA, PA.

1—Traylor 10' x120' Rotary Kiln.
2—Ruggles Cole 90" x 55' Rotary Dryer.
2—Herreshoff Furnaces, 20' dia. 16 hearth.
1—Herreshoff Furnace, 16' dia. 10 hearth.
8—18" Belt Conveyors 28 to 170' long.
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5—Roll Crushers; 54" x 24", 48" x 24", 24" x 24".
6—Steel Bins; 1, 5, 6 & 7 Compartment, 11^0 to 12,000 cu. ft.
Steel Buildings; Structural Steel; Overhead Cranes; Screw Conveyors; etc.

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ILLINOIS

2—Bonnot 7' x 120' Rotary Kilns
1—Vulcan 6' x 50' Rotary Kiln.
1—Ruggles Cole 5'x30' Double Shell Rotary Dryer.
1—New Penn. Non-Clog Hammer Mill, size No. 5060.

OTHER LOCATIONS

1—6' x 50' Rotary Dryer, ⅜" shell.
1—5'6" x 50' Rotary Dryer, ⅜" shell.
1—3'x30' Rotary Dryer, ⅞" shell.
3—Link Belt Roto Louvre Dryers; 6'4" x 24', 3'10" x 20', 3'10" x 16'.
2—Gayco 8' dia. Air Separators.
1—Gayco 5' dia. Air Separator.

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CRUSHERS

CONE, Symons 7' Super Standard
CONE, Symons 3', Portable
GYRATORY, Kennedy, 49, 38½, 37½
JAW, Mitchell, 18" x 9", 25 HP
JAW, Bacon 20" x 6"
DOUBLE ROLL, Gruendler, 24" x 24"
RING ROLL, Sturtevant, 14" x 9½"
BABCOCK & WILCOX Type E32, 75 HP
RAYMOND, 6 Roll, Low Side, 200 HP
RAYMOND, 5 Roll, No. 5057 hi-side Mill
RAYMOND, 3 Roll, #3036 hi-side
HAMMERMILL, PENNA. CRUSHER #5060, Series #DNC, 400 HP, non-clog, 1952—UNUSED.

DRYERS & KILNS

11' x 155' Vulcan Kiln, ¾", UNUSED.
8' x 170' kilns.
8' x 115' Long—½" shell, 2 tires.
7' x 120' kilns, 3 tires.
8' dia. x 70' L, Ruggles Coles, Double Shell, Indirect-Direct heat, ½" shell.
5'6" dia. x 50', Renneburg, ⅜" shell.
6' x 50', Louisville, Steam Tube.
5'6" x 30', ⅜" thick Shell.
4'8" x 33', ⅜" thick Shell.
4' x 24' L, 5 HP, brick lined.

MILLS

CONICAL BALL, Hardinge 4'6" x 16"
COMPEB, Allis Ch., 7' x 24', 450 HP
BALL, Scrubber, Hardinge 8' x 48"
BALL TUBE, Allis, 5'6" x 22, 150 HP
BALL, Marcy No. 64½, 125 HP
ROD, Kennedy V-S, 5' x 10'
ROD, Marcy 7' x 15', 300 HP (4" liners)

MISCELLANEOUS

BRIQUETTING PRESSES, Komarek Greaves, 75 HP, 50 HP, 10 HP
PUG MILLS, 25, 50, 150 HP
STEEL BINS—up to 200 tons storage, all welded construction
5000'—All steel through belt conveyor, 16" & 24"
ALSO—Steel Trough—Belt Conveyors, Bucket Elevators, Steel Screw & Flight Conveyor, etc.

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HEAVY MEDIA PLANTS: One semi-portable, bolted construction, 30 TPH, complete with Densifier, Pumps, Magnetic Separators, Rectifier, Controls, etc. Condition guaranteed, new 1956. One same as above 120 tons per hour with 12 ft. Cone.

CONCRETE BATCHING PLANT: 4 cu. yd. Batch, 300 ton, 4 compartment bin, 1000 bbl. cement Bin, two 84-S Tilting Mixers, Conveyors, Scales, Screws, etc.

BLAST HOLE DRILLS: Bucyrus Erie 42-T, diesel and one electric, with hydraulic jacks.

PULVERIZERS: Two Allis Chalmers 8'x12' Rod Mills with 350 H.P., 3 phase, 60 cycle, 2200 volt motors and control equipment. One 5'x22' and one 6'x22' Tube Mills with motors and drives.

AIR SEPARATORS: 5 ft., 10 ft. and 14 ft.

DENSIFIER: One New Wemco Simplex 48"x27'3", double pitch, with flared tank, motor and drive. **NEW, UNUSED.**

COMPLETE PULVERIZING PLANT with drying, air separating, dust collecting equipment, and screw feeders, boot bucket elevator, etc., with motor and drive.

GYRATORY CRUSHER: Allis Chalmers 10-K, openings 24"x82".

JAW CRUSHERS: Allis Chalmers 36"x48" all steel, class 1-A. Traylor 15"x24" with motor and V-belt drive. Other crushers 4x8" to 48x60".

REDUCTION CRUSHERS: Two Symons Cone 5½ ft. standard bowl with 200 H.P., 3 phase, 60 cycle, 2200 volt motors and control equipment. Nordberg 4¼ ft. Cone with 200 H.P. motor.

DRYERS, KILNS, COOLERS: Two 8'x125' Kilns, one 9'x130' Kiln, one 10'x200' Kiln. One 104"x50' Dryer, one 3'x27' Dryer, one 90"x55' Dryer, one 6'x50' Cooler, one 5'x50' and 5'x60' Coolers.

CARS: 10 yd. capacity Phoenix, standard gauge, heavy duty, quarry type, automatic couplers.

OVERHEAD ELECTRIC TRAVELING CRANES: One 80 ft. span, 25 ton, 4 motor, 220/440 volt, A.C., trolley new 1955. One 56 ft. span, 3 motor, 110 volt, direct current. The above with or without runways and D.C. Generator.

MINE HOISTS: Nordberg double drum both clutched, 10'x10', 1¾" rope, 1200 FPM, forged steel drum shells, complete with all thoroughly modern electrics. One Allis Chalmers single drum 10'x10', 1¼" rope. Can furnish with either 700 or 400 H.P. motor, 3 phase, 60 cycle 2200 volt. Offered with or without motor and controls. One single drum 84" dia., 60" face, 1⅜" rope, 32,000 lbs. pull, 250 FPM, 150 H.P., 2200 volts, post brakes, Lilly control, dial indicator. Condition like new. Other hoists sizes 100 H.P. to 2500 H.P.

COMPRESSORS: 2—Chicago Pneumatic OCE, 1300 CFM@ 100# pressure, 20x12x14, 250 H.P., 257 RPM, with intercooler, aftercooler and control equipment.

WE BUY AND SELL EQUIPMENT THROUGHOUT NORTH AND CENTRAL AMERICA.

A. J. O'NEILL
Lansdowne Theatre Bldg.
LANSDOWNE, PA.
Phila. Phones: MAdison 3-8300—3-8301

1—13" x 30" Type B Farrel Bacon Jaw Crusher
1—#5 Champion Good Roads Jaw Crusher, 12" x 26"
1—10" x 20" Allis-Chalmers Blake Type Crusher
1—36" Telsmith Gyrasphere Crusher plus many repair parts
1—36" x 20' Revolving Screen
1—36" x 11' Revolving Screen with Scrubber
1—30" x 14' Revolving Screen
1—3' x 5' Link-Belt Foundry Shakeout Screen
New All-Steel & Manganese J. & H. Hammer Mills 5½" x 18"
4—12" Conveyors—various lengths
We build open and totally enclosed bucket elevators and belt conveyors to suit your needs.
Large stock chain, sprockets, buckets and conveyor pulleys—new and used.

JOHNSON & HOEHLER, INC.
P. O. Box 152, Lansdowne, Pa.

SURPLUS EQUIPMENT

Available throughout the U.S.—Items you need may be available near you. Your inquiries would be appreciated.

Buildings	Draglines	Loaders	Pavers
Bins	Ditchers	Locomotives	Rollers
Barges	Dredges	Mixers	Rail
Buckets	Drills	Motors	Scales
Belting	Derricks	Mills	Screens
Cableways	Engines	Machine-tools	Slackilines
Cars	Excavators	Pulverizers	Shovels
Compressors	Feeders	Pipe	Tanks
Conveyors	Graders	Pumps	Tractors
Crushers	Generators		Trailers
Dryers	Hoists		Etc., Etc.
	Kilns		

(I can sell your surplus equipment)

ALEX T. MCLEOD
MARIETTA, KANSAS

SPECIAL ITEMS

Iowa 55"x60" dbl. Impact hammermill
Sturtevant 16" air separator 75 HP elec. motor
Pangborn CH-2, exhaust blower, etc.
Traylor 56"x72" sectional frame jaw crusher
Traylor 4' Model TY crusher. Numerous spare parts.
Symons 4¼' cone crusher, std. head coarse bowl
Nordberg Gyradisc 54" 200 HP elec. motor
Belt conveyors 24" 36" 42" var. lgths some w/electro mag. hd. pulleys; 24x24', 24x20" 24x30" 30x42".

CONCRETE MIXERS

Ransome Model 84S, 3 yd. tilting type
Smith 422, 4 yd. tilting type
Koehring 56S 2 yd non tilting type

TRUCKS—TRANSIT MIXERS

15 Ford F8-6 yd. end dump. Excel. Reinforced, 1955.
10 Mack LR8W 32 ton rear dump trucks Cummins NHIRS-600 300 HP Diesel Motor Allison converter-transmission.
6 Euclid 26 TD end dumps 300 HP Cummins Diesel
2 Int. LF-192 Blaw knox 6½ yd. 1953.
6 Smith tan. ax. Diesel. 1953, 3½ yd. mixing
4 Smith tan. ax. 4½ yd. mixing

CRUSHERS—KILNS—DRYERS

JAW: Acme 10x20, 15x36, 14x26, 14x28, 10x42, 16x32, 18x32, 25x40. Eagle 10x16, 20x36. Diamond 24'36". Cedar Rapids 10x20, 15x36, 20x26, 25x40. Farrell 10x20, 18x30, 14x36, 18x36, 36x48. Buchanan Type C 30x42, 36x42. Traylor 15x26, 24x36. Allis-Chalmers 30x18. Good Roads 10x30. Telsmith 18x32. Universal 18x24.
GYRATORY: Al-Chal 6, 7½, 8, 9, 10, 12, 16, 18, Telsmith TY 4', 5' Gyrosphere
25B Kennedy Van Saun 12, 37½, 38, 49½"
ROLL: Cedar Rapids 40x20. Pioneer 40x22. Pioneer 30x18. Telsmith 24x16.
HAMMERMILL: Jeffrey Type BS 24x20, Type B 36x24, 36x36, 36x42. Eagle 24x24, Stedman 24x30, 36", 42" Cedar Rapids 50-50, 30x33.
BALL MILL: Hardinge conical 10'x48", 8'x48". 8'x36", complete, motors, Traylor 7'x35'.
TUBE MILLS: Smidth 6'6"x21', 5½x20'.
ROD MILL: Marcy 3'x8' and 8½'x12' center discharge; 3'x6'; 5'x12'
ROD MILL: Marcy 3'x8' center discharge Marcy 3' x 6', Marcy 5' x 12', 5½' x 12' center discharge
AUTOCLAVES: J&C 6'6"x58' Quick Acting; 6'x50'
CONE: Symons 3', 4¼', 7'.
KILNS: 4'x42', 5'x30', 6'x50'6", 6'4"x45', 6'x72' Vulcan 9x100, 10'6"x105', 8'x124', 6'x90', 6'x72'.
DRYERS: 6'x60', 6'x72', 5'x34', 4'6"x33', 3'6"x20', 6'x30', 5'x35 rotary current.
COMPER MILLS: A-C 7'x24', Patterson 7x18.
FEEDERS: Syntron F55 44x72", 48x80", Jeffrey 35x72".

CRUSHING—WASHING—CLASSIFIER PLANTS

C-R NEW NEVER USED complete 2236 jaw.
Pioneer Port. 10x24 jaw 24x16 roll compl. Diesel
C-B 2540 Prim. Port. Diesel
A-W 61E 1024-16C6 jaw crusher
C-B Primary Port. 22x36 Jaw. Diesel.
Eagle 36x25' single screwspiral flights washer classifier dehydrator
Lippman Port. WASHMORE washing plant, 36"x 16" sand classifier, 48"x72" revolv. scrubber etc.
Telsmith 60"x20' gravel or stone super scrubber, complete 40 HP motor
Telsmith Twin Screw sand classifier 20"x15'
Eagle 24"x25' dbl. screw washer 15 HP motor

CONCRETE PLANTS AND EQUIPMENT

Noble CA 154 Semi-automatic 150 ton 4 compt. aggregate bulk cement silo 2000 cu. ft.
Erie Strayer port. New 1955, 40 yds. per hr. 600 bbl. cement silo
Johnson 400 yd 5 aggr. 1500 bbls. cement batch 5000 bbl. silo 3-2 yd mixers
Johnson automatic batch 10,000 bbls. cement storage 3-2 yd mixers; screening equipment.
Johnson TY 22S 2 compt. agg. w/TY1320 cement unit
Blaw-Knox BCPC 600 bbl cement silo
B-K BCPC 400 bbl High cement bin 400 bbl silo.
Blaw-Knox BCPC 300 bbl cement bin
Auto-Crete port. batching plant, self contained, elec. up to 150 yds per day; one man operation.
Pre-Mix 150 ton 4 compt. 3 aggr. 1 cement; ground cement silo 2 yd concrete mixer. New 1955.
Erie Strayer Port. 3 compt. aggr. 600 bbl cement
B-K 2 aggr. one cement 400 bbl silo. Complete

HYDRAULIC SUCTION DREDGES

Morris 6" Diesel on 14'x36' hull
Ga. Iron Works 8" suc. 6" disc. Diesel New 1957.
10" Portable Diesel powered. Complete.
12" Diesel powered, pontoon mounted. Complete
Ellicott 8" with cutter. Diesel Hull 48'x18'x3'6"
6" Hydraulic Diesel. On 32'x8' steel pontoons
6" portable Diesel complete with cutters, etc.

SCREENS

Trommel 6'x45'3" 75 HP gearhead A.C. motor.
New Holland 4'x12' 2 deck, V-belt drive
Tyler-Hummer 4'x10' 2 deck, new spare parts
Simplicity 5'x12' 2 deck
Pioneer 5'x12' 2 deck 20HP elec. motor
C-B 4'x14' 2 deck 25 HP motor

RICHARD P. WALSH CO.
30 Church St. New York 7, N.Y.
CO 7-0723 Cable: RICHWALSH

JAW CRUSHERS

60"x48" to 6"x3"

New and used RELIABLE

"Farrel-Bacon" Jaw Crushers

BACON-PIETSCH CO., INC.
26 Park St., Montclair, N. J.
29 Washington Ave., Hamden, Conn.
Phone Montclair—Pi 6-1300

QUARRY EQUIPMENT

Cedarapids 3042 double impeller. Rebuilt
Cedarapids 3033 Hammermill with new components.
Cedarapids 3033 Hammermill secondary plant on rubber.
Cedarapids 2036 Primary Crushing Plant
Cedarapids 1236 Twin Jaw Crusher. Excellent.
Cedarapids 1236 Twin Jaw Portable Plant.
Telsmith 13 B gyratory crusher.
Scottdale model 63 double roll coal crusher.
26" x 8'4" apron feeder with drive.
Robins 4' x 9' triple deck screen.
New Holland 4' x 12' double deck screen. Rebuilt
Pioneer 4' x 8' double deck screen. Rebuilt
27½ ton, single-compartment 8' x 12' bin.
2—Eagle 36" x 20' Double Log Washers. Good.
McLanahan & Stone 12" x 30' Double Log Washer. Good.
Telsmith 84" x 12' Super Scrubber. Good.
Wemco 24" x 13' Sand Preparation Machine. Good.
60-ton, two-compartment, 8' x 18' storage bin with clam gates.
100-ton, two compartment, 13' x 23' bin
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also conveyor belting.

SHOVELS AND CRANES

Lorain L-820, 2-yd. Diesel Shovel-Crane.
P & H 855B-LC, 2-yd. diesel dragline.
P & H 655B1½ yd. diesel dragline reconditioned.
Lorain L-79, 1½-yd. diesel shovel rebuilt.
Bay City 65, 1¼-yd. diesel crane. 55' boom.
Bucyrus-Erie 38B, 1½-yd. Diesel Dragline. Rebuilt.
Lorain L-41 ¾-yd. diesel backhoe reconditioned.
Lorain L-50K, 1-yd. Diesel Crane. Excellent.
Lorain L-26, ¾-yd. Diesel Dragline. Excellent.
2—Lorain L-26, ¾-yd. Diesel Backhoes. Excellent.
Lima 34 Paymaster ¾-yard diesel shovel. Good
Unit 1020 ¾-yard diesel powered shovel-crane
Lorain TL25S ¾-yd. gas clam-crane.
Koehring 304 ¾-yd. diesel shovel.
Koehring 304 ¾-yd. diesel backhoe
Wayne 50B, 25-ton truck crane. 18 mos. old.
Unit 614, ½-yd. Diesel Backhoe.
Lorain MC-414 20-ton Moto-Crane reconditioned.
Link Belt HC-90 25-ton truck crane
Lorain MC-504W 25-ton Moto-Crane.
Lorain MC-4 15-ton Moto-Crane.
Lorain TL-20 10-ton gas Moto-crane.
Lorain SP-107, 7-ton self-propelled crane
Lorain MC-2, 10-Ton Moto-Crane.
Michigan TM16, 10-ton gas truck crane.

TRACTORS, TRUCKS, SCRAPERS, ETC.

4—Euclid TS-24 Twin Engine Scrapers.
2—Euclid TS-18 twin engine scrapers.
4—Euclid 18-yd. overhung engine scrapers.
2—Euclid 12-yd. overhung engine scrapers
3—Euclid 7-yd. overhung engine scraper.
1—Euclid 15½-yd. six wheel scrapers.
2—Euclid 13-yd. bottom dumps. Good.
2—Euclid TC-12 twin engine tractors.
1—Euclid 22-ton rear dump. Good.
1—Euclid 18FD, 15-ton rear dump.
1—Mack LRS 15-ton rear dump. Rebuilt
1—Pullman S-600. 6 to 8 yard scraper.
1—Caterpillar DW-10 hydraulic scraper.
1—International TD-14A tractor with PCU
1—International TD 18 with cable bulldozer blade.
1—Euclid tractor with 3200 gallon water tank semitrailer
1—Cat. D-7 with Hydraulic Angledozer Blade.
1—Cat. D-6 with hydraulic angledozer blade.
1—Caterpillar D-4 Tractor only
1—Internat'l. 300 tractor, with loader backhoe.
1—Allis-Chalmers HD-19 tractor with cable bulldozer blade.
1—LaPlante choate 13½-yd. Cable scraper
1—Atco H85, 10½-yd. Hydraulic scraper
1—Baker-Lull 65 diesel shoveloader. Recond.
1—Hough HA gas front end loader. Recond.

SHOVEL ATTACHMENTS

Lorain 820, 2-yd., 23' boom, 21' stick
Lorain 50, 1-yd , 21' boom, 17' stick
Lorain 40, ¾-yd., 19' boom, 16' stick.
Lorain 30A, ½-yd., 16' boom, 13'4" stick.
Osgood 903, 2-yd., 24' boom, 20'6" stick.

BACKHOE ATTACHMENTS

Lorain 40A, 18' boom, 7' stick, 28", 36" or 44" bucket.

DIESEL POWER UNITS

Cat. D7700, 74 H.P. at 1000 RPM. Rebuilt
Cat. D8800, 88 H.P. at 1000 RPM.
Cat. D13000, 128 H.P. at 1000 RPM. Rebuilt.
GMC Twin Diesel, rebuilt.
GMC 3021C, 3-cylinder, new.

AIR COMPRESSORS

105 cu. ft. LeRoi tractair with dozer, backhoe.
210 cu. ft. Gardner-Denver Diesel Portable.
3—125 cu.ft. Gardner-Denver Gas Portables.
125 cu. ft. Jaeger gas portable.
210 cu. ft. Gardner Denver gas portable.
315 cu. ft. Schramm gas portable.
500 cu. ft. Ingersoll-Rand. Waukesha power
4—600 cu. ft. Gardner-Denver diesel portables.
420 cu. ft. Gardner-Denver two-stage stationary Rebuilt.

L. B. SMITH, INC.
Camp Hill, Pa.
Phone Harrisburg REgent 7-3431

BONDED QUALITY BARGAINS

NEW CURRENT MODELS - IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE FOR FREE CATALOG AND PRICES

BONDED® TROUGHING IDLER CONVEYOR BARGAINS

CONVEYOR PRICES INCLUDE BELTING

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams, with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2¼" or 2⅞" diameter shaft.
We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. WRITE FOR BULLETIN #1138.
Bonded troughing idler conveyors also available in Truss Frame Construction. WRITE FOR BULLETIN #1189 AND PRICES.

Belt Width	Length of Conveyor	List Price	Sale Price	Add or Deduct Per Ft.
14"	25'	$1397	$ 722	
14"	50'	2222	1144	$16.84
14"	85'	3377	1733	
16"	20'	1262	636	
16"	45'	2137	1088	
16"	60'	2662	1359	18.04
16"	90'	3712	1900	
18"	25'	1477	794	
18"	45'	2217	1166	
18"	70'	3142	1648	
18"	85'	3697	1933	19.24
18"	100'	4253	2220	
18"	130'	5362	2797	
20"	25'	1517	828	
20"	60'	2692	1533	
20"	75'	3467	1838	20.37
20"	90'	4052	2145	
24"	25'	1590	898	
24"	45'	2430	1330	
24"	70'	3480	1875	
24"	100'	4740	2514	21.78
24"	120'	5580	2958	
24"	150'	6840	3603	
30"	50'	2911	1617	
30"	70'	3871	2119	24.75
30"	90'	4831	2614	
36"	25'	1818	1118	
36"	45'	2858	1678	
36"	60'	3638	2096	27.95
36"	100'	5718	3214	

BONDED® QUALITY BUILT BUCKET ELEVATORS

RIGID THRUOUT - MINIMUM VIBRATION AND NOISE

ENCLOSED ELEVATOR

Open or Enclosed, Vertical or Inclined Bucket Elevators with Continuous or Spaced Buckets mounted on Chain or Belting. Bonded's 19 standard models are designed for low cost, high capacity elevating of practically all bulk materials. Open and other types priced on request. There is a style of bucket for virtually every material or condition: wet or dry, lumpy or fine, granular, slivery, or pellet shapes, hot or chemically active.
Prices listed at right are for Vertical Enclosed Elevators. Standard Elevators with Chain mounted buckets use #477 or #C102B combination chain. 4, 5 and 6 ply, 32 oz. or 35 oz. duck belt is used on Belt mounted Bucket Elevators.
Bonded Bucket Elevators are Jig Built to insure easy Job-Site Installation.

Model No.	Bucket Size Inches	First 20' (Discharge Ht.)	Add or Deduct Per Ft.
Style "A" Spaced Malleable Buckets on Chain			
C53A	5x3½	$1071.50	$20.25
C64A	6x4	1088.50	21.00
C85A	8x5	1235.00	25.50
C106A	10x6	1281.00	27.50
C127A	12x7	1510.00	31.25
C148A	14x8	1673.50	36.00
Style "A" Spaced Malleable Buckets On Belt			
B53A	5x3½	$1099.00	$20.50
B64A	6x4	1116.50	21.25
B85A	8x5	1311.50	27.25
B106A	10x6	1692.50	33.00
B127A	12x7	1854.50	37.25
Style "E" Continuous Steel Buckets On Chain			
C85E	8x5x 7¾	$1397.00	$31.25
C126E	12x6x11¾	1599.00	34.25
C108E	10x8x11⅝	1604.00	34.75
C128E	12x8x11⅝	1624.00	35.50
C148E	14x8x11⅝	1710.00	36.75
Style "E" Continuous Steel Buckets On Belt			
B85E	8x5x 7¾	$1727.50	$34.50
B116E	11x6x 8¾	1839.50	38.75
B128E	12x8x11⅝	2013.00	43.50

A complete line of parts and accessories available to build your own Bucket Elevators. Continuous Steel, Salem Steel and Malleable Iron Buckets available in a wide variety of sizes, shapes, gauges and styles at low prices. WRITE FOR BULLETIN #1203 AND PRICES DESCRIBING COMPLETE LINE OF BUCKET ELEVATORS AND BUCKETS.

BONDED HDF SERIES HEAVY DUTY AND PAN FEEDERS

EF SERIES Capacities to 60 TPH

Bonded EF Series Economy Feeders are ideal for confined spaces and in portable plants. For medium duty service. Available with or without hoppers. Priced From $224.00

Bonded HDF-18 Heavy Duty Feeders were especially designed for abrasive materials such as Ore, Rock, Crushed Stone, Gravel, Sand, Clinkers, Abrasive Volcanic Ash and Rock. Abrasion Resistant Alloy Steel Plate is used for all parts that contact the material. Capacities to 440 Tons Per Hour.

HDF Series Plate Feeder - Priced From $925.00

HDF SERIES

Capacities to 440 Tons Per Hour

WRITE FOR BULLETIN No. 1211

BUY WITH CONFIDENCE. References are: Ohio National Bank, Columbus, Ohio, Dun and Bradstreet, and more than 7,000 mines and quarries using Bonded equipment.

NEW CONVEYOR BELTING AT NEW LOW PRICES SAVE UP TO 34%

WE PAY FREIGHT ON 200 POUNDS OR OVER

QUALITY TESTED CONVEYOR BELTING*

Major Brand: 12# to 15# Average Friction Pull. 800# to 1000# Average Cover Tensile.

Heavy Duty 4-ply, 28-oz. duck, 1/8" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

Width	Ply	List Price	Sale Price
14"	4	$3.63 ft.	$2.63 ft.
16"	4	4.08 ft.	2.77 ft.
18"	4	4.51 ft.	3.06 ft.
20"	4	4.97 ft.	3.54 ft.
24"	4	5.85 ft.	3.97 ft.
30"	4	7.18 ft.	4.85 ft.
36"	4	8.51 ft.	5.76 ft.

Major Bee Brand: 16# to 19# Average Friction Pull, 2500# to 3000# Average Cover Tensile. Skim coat between plies.

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

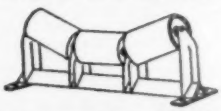
Width	Ply	List Price	Sale Price
14"	4	$ 4.31 ft.	$2.85 ft.
16"	4	4.85 ft.	3.22 ft.
18"	4	5.39 ft.	3.57 ft.
20"	4	5.90 ft.	4.07 ft.
24"	4	6.94 ft.	4.60 ft.
30"	4	8.53 ft.	5.66 ft.
36"	4	10.09 ft.	6.84 ft.
24"	5	8.14 ft.	5.38 ft.

*All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.

Other widths, plies, duck weights and cover thickness available at low prices.

WRITE FOR FREE SAMPLE & BULL. #1200

IDLERS AND RETURN ROLLS SAVE 25% AND MORE



3-roll, 5" diameter Troughing Idlers for:					
14" belt	$18.50	24" belt	$21.25
16" belt	19.25	30" belt	22.00
18" belt	20.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:					
14" belt	$7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable prelubricated sealed ball bearings. Maintenance is negligible. WRITE FOR BULLETIN #1138.

BONDED SCALE AND MACHINE COMPANY

PHONE Days: Hickory 4-2186 — WRITE FOR FREE CATALOG AND PRICES — PHONE Evenings: AX. 1-2213, HU. 6-3156

128 Bellevue — Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders — COLUMBUS 7, OHIO

BONDED VIBRATING SCREENS

PROMPT SHIPMENT OF ALL MODELS

GENERAL DUTY SCREENS

PERFECT BALANCE AND SHARP ACTION. Eccentric weight mechanism, spring mounted. 1 to 3 decks, 2′ x 4′ to 5′ x 8′. **WRITE FOR "SEVEN SECRETS OF SUCCESSFUL SCREENING" IN BULLETIN NO. 1086.**

For the accurate and economical screening of sand, gravel, crushed stone, ores, broken rock, slag, clay and cement products and lightweight aggregates. All Bonded Screens built of structural steel, welded and reinforced with additional members on all points of strain and factory tested and balanced. Available in enclosed models where dust and flying particles need to be contained. For almost any type of screening operation, wet or dry.

Priced from 2′x4′ @ $443 to 3′x8′ @ $996

SPECIAL SERVICE SCREENS

WRITE FOR BULLETIN #1224 TYPE C

For scalping middle-range pieces and accurate sizing of fines and above listed products but where quantity and feed do not warrant a larger capacity, heavy duty model. Medium to heavy construction. Can also be suspended from four steel cables and springs for portable or temporary installation. Vibration remains in working screen body. No shaking of tipple, building or platform.

Priced from 2′x4′ @ $487 to 3′x8′ @ $1096

HEAVY DUTY SCREENS

FACTORY BALANCED, CONTROLLED VIBRATION. Four bearing positive throw eccentric shaft; 3′ x 6′ to 5′ x 14′. 1 to 5 decks. **WRITE FOR BULLETIN NO. 1087 AND 9 REASONS WHY BONDED IS YOUR BEST BUY.**

For high tonnages, heavy scalping and multiple sizing of such minerals and industrial products as handled by above models. No dead spots. Springless live-rubber mounting of screen body controls vibration. Screen cloth and plate in all models reversible for longer life. Their finished edges prevent plates from splitting and cloth from ravelling.

Priced from 3′x6′ @ $1620 to 5′x14′ @ $5660

THE BONDED SCALE AND MACHINE COMPANY

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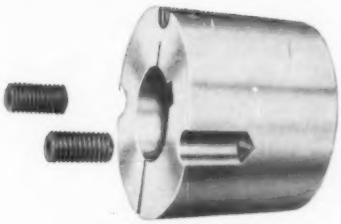

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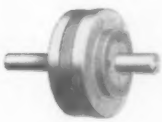
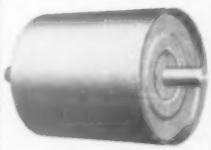
Change from sheaves to sprockets to couplings to conveyor pulleys				

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"My Boss Read the Specs with Tears in His Eyes"

He looked like he'd lost his best friend — money.

"Goodbye contract," he said quietly. "We just can't hope to meet these government specifications for aggregate."

"Yeah, it's pretty hopeless with our set-up. Of course, if we had a hydraulic classifier — " (I was kidding.)

"You're out of your mind. Around here water costs more than sand."

"Well how about an air separator, like Sturtevant makes?" I shot back. "Pete's brother runs a pit at Rapid City and says they clean sand without water. By de-dusting it."

He was skeptical. "Aren't Sturtevants for cement?"

I nodded. "They are, but you see quite a few in aggregates, too, nowadays. Might be worth a try."

The Boss smiled for the first time that morning. "What the heck are you waiting for? Get 'em on the phone and let's see what they can do."

So we got the contract, thanks to the 12 ft. Sturtevant we now use for de-dusting and pre-classification. It's a beaut. Gives good service outdoors the year round, with no protection except for the motor housing.

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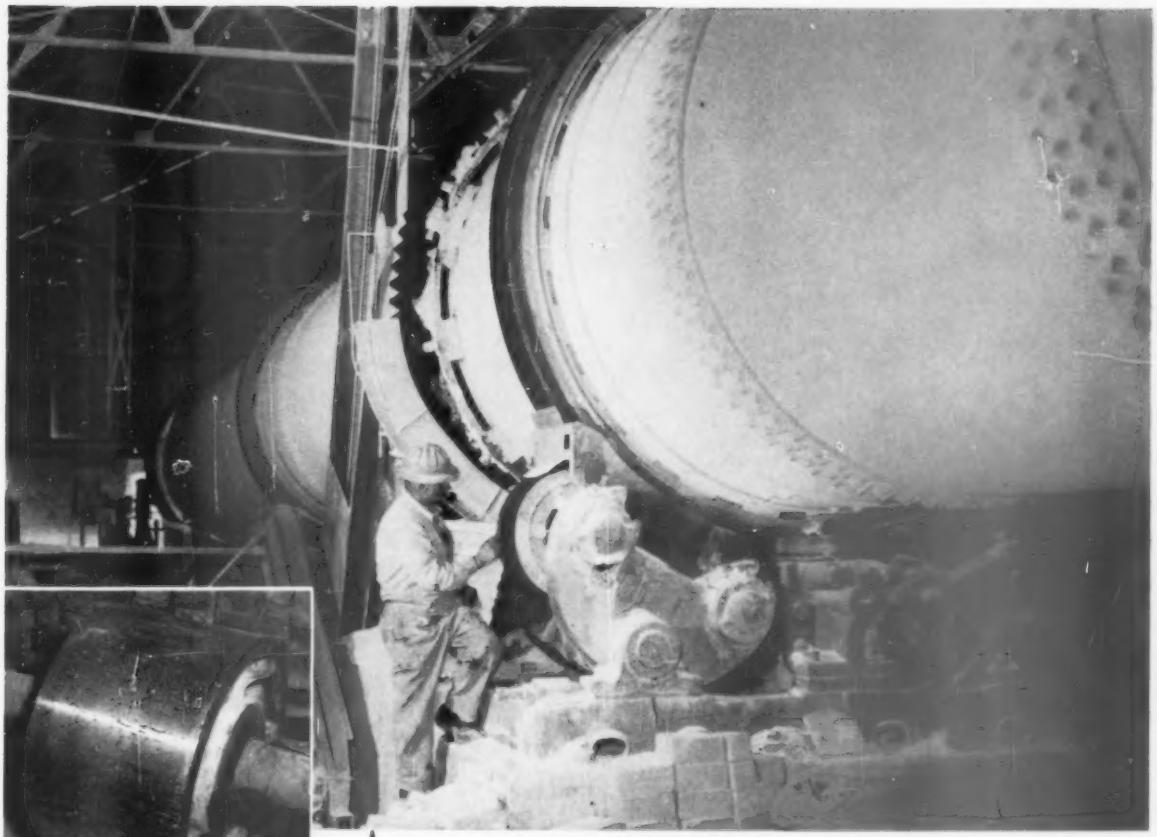

View showing relative size and position of furnace, rolls and rings.

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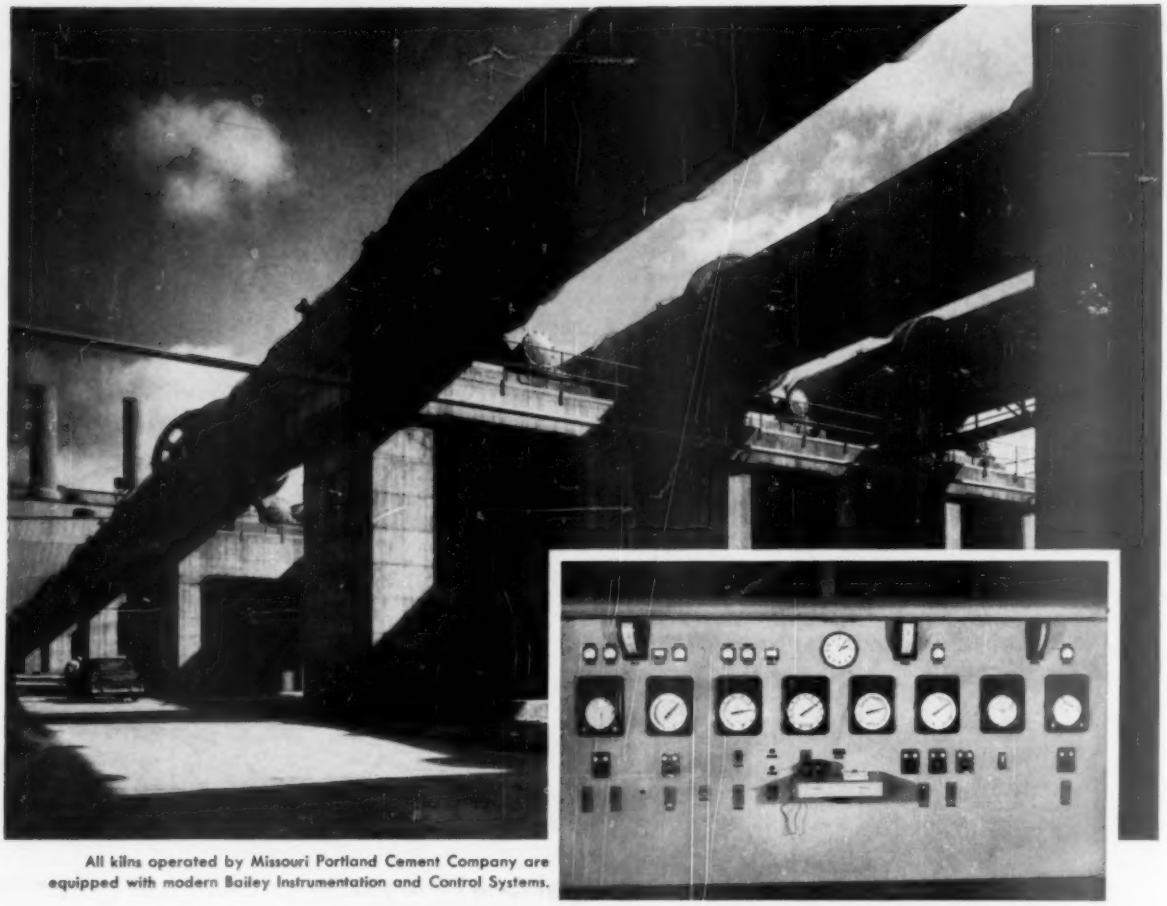

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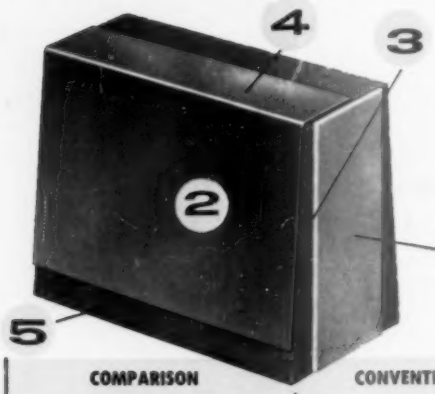

Kaiser Unitab Kiln Liners*

Each of these five comparisons shows another Unitab Liner installation advantage!

COMPARISON	CONVENTIONAL BRICK	KAISER UNITAB LINERS	UNITAB LINER FEATURE
Cardboard spacers for longitudinal expansion	Install by hand	Attached to brick at factory	Combustible spacer automatically provides correct allowance for longitudinal expansion (between rings)
Steel plates between bricks for bonding	Install by hand	Attached to brick at factory	Bonding shim to liner assures automatic placement of shim
Provision for circumferential expansion	Install cardboard spacers by hand	Expansion provided by thickness of adhesive that bonds shim to brick	Thickness of combustible adhesive provides correct allowance for circumferential expansion (within ring)
Hot face indicator	No hot face indicator	Clearly identified by touch or sight	Plate overlapping hot face makes visual inspection quick—easy to see that each brick is correctly installed
Effect on reducing shell temperature	None	Design provides heat buffer to reduce shell temperature	Half-inch gap between end of shim and shell acts as heat buffer to reduce shell temperature for greater kiln efficiency

*U. S. Patent No. 2829877

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